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The effect of gas flow rate on plasma etched porosity of Acrylonitrile-butadiene-styrene plastic

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THE EFFECT OF GAS FLOW RATE

ON PLASMA ETCHED POROSITY OF ACRYLONITRILE-BUTADIENE-

STYRENE PLASTIC

A Thesis

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by

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ABSTRACT

THE EFFECT OF GAS FLOW RATE ON PLASMA ETCHED POROSITY OF ACRYLONITRILE-BUTADIENE-STYRENE

by Mai M. Abuelazaim

The effect of varying gas flow on the surface porosity of Acrylonitrile-butadiene-styrene plastic during plasma etching was studied. Two different types of etching gas, oxygen and helium, were used. The main objective of this study was to determine the effect of changing the type of the gas flow rate on number and size of pores etched on plastic surface. Gas flow rate was varied between 25 and 100 mL/min, while keeping all other plasma etching parameters constant.

Scanning electron micrographs were taken of different etched surfaces to record their porosity. For each gas the number, the average diameter, and the average surface area of pores were measured and averaged over two samples at each flow rate. Results showed that for both oxygen and helium, increasing the gas flow rate increases the number of pores and decreases the average pore diameter. Oxygen produced fewer of pores with wider diameter than those produced by helium.

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1.0 INTRODUCTION

1.1 Plating Industry

During the past half century, low cost plated plastic parts have replaced metal parts in many industries. Since the 1950's, plating on plastics has been used as a method for mass production of printed circuit boards. In the 1970's, cost cutting measures in automotive manufacturing methods resulted in the replacement of metal parts by electroplated plastic parts for interior trim and some exterior components (Wedel, 1971). Metal plating can improve the corrosion resistance of plastic surfaces and makes an attractive finish (Villamizar, 1981).

Acrylonitrile-Butadiene-Styrene (ABS) is the most commonly used plastic substrate for electroplated plastic parts (Lindsay, 1985). ABS possesses balanced properties from the standpoint of being the easiest type of plastic to process and plate at a reasonable cost. In addition, ABS has been reported to have a high performance in end-use products as a result of forming strong and durable bonds with electroplated metals.

1.2 Etching Methods

Plastic surfaces are typically smooth and have poor wettability characteristics as shown in Figure 1. These characteristics result in negligible adhesion between metal and plastic. Surface modification of the plastics is a necessary step for attaining adequate adhesion. This surface modification step is called etching. Different surface etching methods are used in industry. Kaplan et al. (1987) have compared several etching methods, as shown in Table 1.

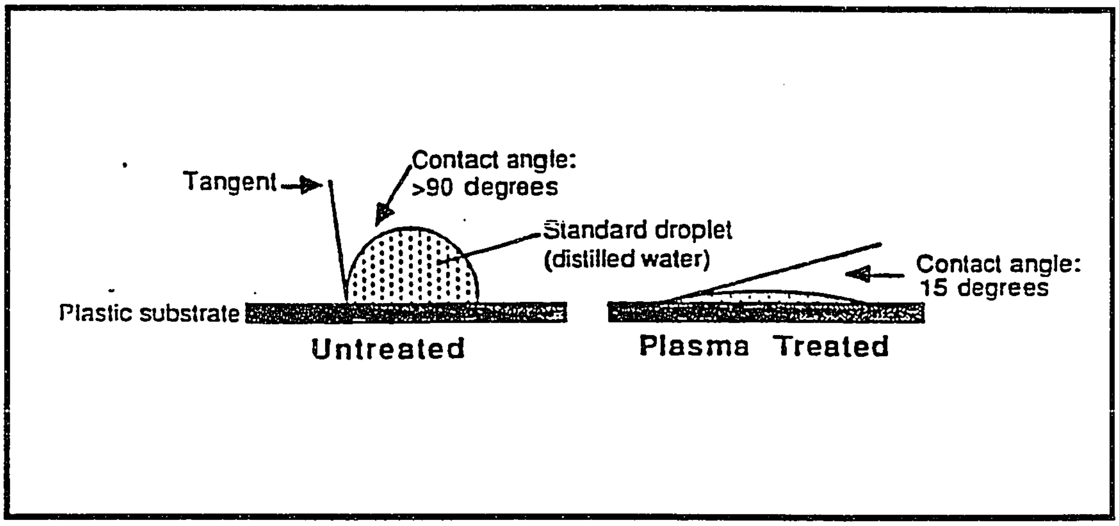


Figure 1. Plasma etching effect on plastic surface wettability characteristics as measured by contact angle (Kaplan, 1987).

Table 1. Comparison of different etching methods (Source: Kaplan, 1987).

Surface Treatment	Bond Strength	Consistency	Versatility	Capital Cost	Labor Intensity	Disposal Cost	Impact on Environment
None	Low	Poor	-	None	None	None	None
Mechanical Abrasion	Good	Poor	V. Good	Little	V. High	V. High	Dust
Solvent Wipe	Good	Fair	Good	Low	V. High	Moderate	Organic Vapor
Vapor Degreasing	Good	Good	Good	Moderate	Fair	Moderate	Organic Vapor
Flame	Good	Fair	Poor	Moderate	Moderate	Moderate	Open Flame
Acid Etch	Good	Fair	Poor	High	Moderate	High	Fume, Flammable
Corona	Good	Good	Poor	High	Low	High	Ozone
Plasma	V. Good	V. Good	V. Good	V. High	Low	V. Low	Low

To date, chromic acid etching has been the industry standard. However, alternative etching methods are gaining favor due to environmental concerns about disposal of generated toxic waste. Plasma etching is a promising alternative, it has minimal hazardous waste residues. Though plasma etching equipment has a higher initial capital investment compared to other etching methods, it produces consistent results, provides versatility and has low operating and labor costs. The absence of waste disposal problems outweighs the disadvantage of the higher initial cost. In addition, plasma treatment is often the only etching procedure which can adequately modify certain types of plastics such as polypropylene (Kaplan, 1987).

A plasma is a partially ionized gas containing free electrons, ions and various neutral species at different levels of excitement. Plasma conditions can be created in a vacuum chamber by applying a dc voltage across two electrodes inserted in a low pressure gas atmosphere. A plasma can also be created by subjecting a low pressure gas to a radio frequency (RF) field. A typical plasma etching chamber is shown in Figure 2. Gas molecules can be excited, dissociated or ionized depending on the energy applied (Lindsay et al., 1985). These excited particles interact with the solid surfaces placed in the plasma chamber and cause modification of the surface molecular structure. Surface modification takes place due to one or more of the following processes: evaporation of low molecular weight compounds, embedding of species from the gas phase into the surface matrix, and cross linking of surface polymeric chains.

Etching processes can significantly modify plastic surfaces and change the surface porosity. The plasma etching process causes a change on the surface of the plastic to a depth of several molecular layers, thus producing a porous surface layer. This induced surface porosity is also dependent on the composition of the surface and the nature of the gas used (Kaplan, 1990). Different plasma gases react differently with contacted surfaces, producing different chemistries. The polymer surface composition also controls the types of surface reactions possible, and thus the resultant surface porosity.

However, the interactions between the plasma gas and the plastic surface, and the factors affecting these interactions have not been extensively reported in the

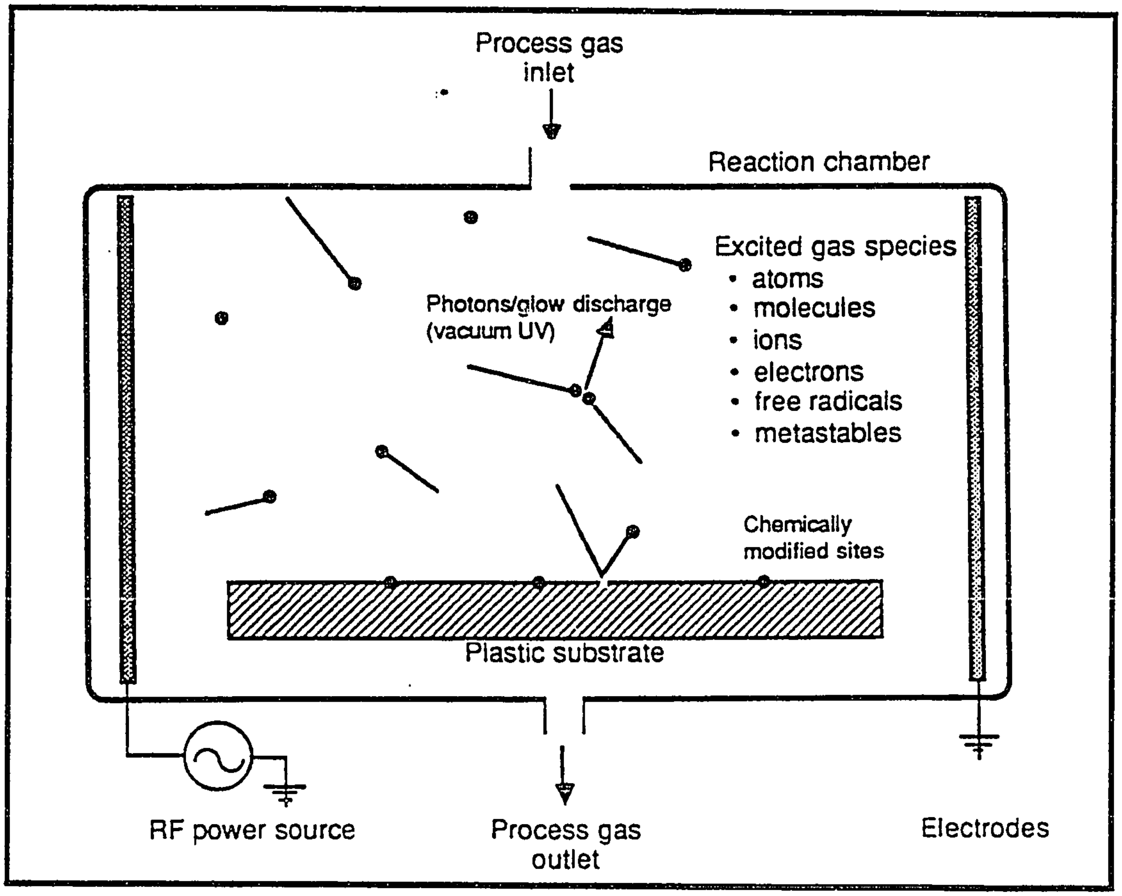


Figure 2. Schematic of the surface modification of plastic in a gas plasma chamber (Source: Kaplan et al., 1990).

literature. Generally, these factors are either plastic surface related (type and composition of the substrate, substrate temperature and substrate size), chamber related (fixture material and geometry, chamber pressure and radio frequency power), or gas plasma related (type of gas or gases, flow rate, residence time and presence or lack of ion bombardment).

In this study the effect of gas flow rate on the porosity of ABS plastic was investigated. Two gases, oxygen and helium, were used in order to compare the resulting porosity obtained from an oxidizing plasma versus an inert plasma.

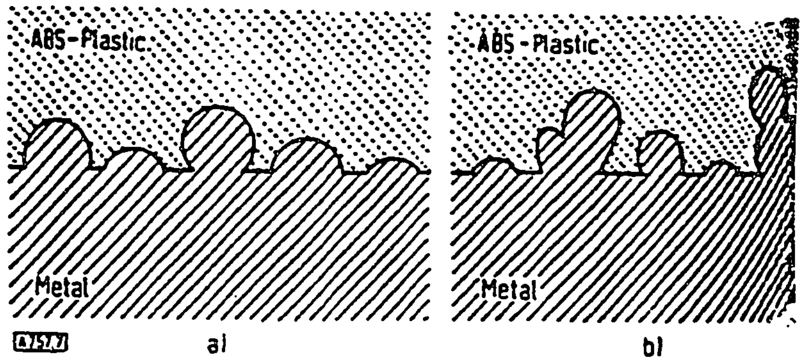
2.0 LITERATURE REVIEW

2.1 Mechanisms of Adhesion Between Metals and Plastics

The mechanisms of adhesion and the nature of the bonds formed between the electroplated metal and plastic are not well understood at this time. Investigators who have published research results on this topic can be divided into two major groups. One group, such as Heymann et al. (1970), Elmore et al. (1969), and Kato (1968), proposes that the adhesion mechanism is mainly due to a mechanical interlocking-type bond of the type shown in Figure 3. The other group, such as Brockmann (1989) and Matsunaga et al. (1968), proposes that the etchant chemically alters the surface of the plastic so that a chemical bonding of the plastic and the electroplated metal produces good adhesion.

Elmore et al. (1969) investigated the nature of the metal-to-plastic bonds in a study of the adhesion of electroless copper to ABS plastic. Scanning electron microscopy (SEM) was used to view the surfaces of substrates subsequent to chemical processing and electroless and electrolytic plating. The SEM examination revealed that interlocking surfaces, which permitted mechanical bonding at the copper-plastic interface, were present. When these surfaces were replicated on epoxy, bonding between this surface and electroless copper was obtained. Heymann et al. (1970) and Kato (1968) reported similar results from their studies.

Rantell (1969) measured the peel strength of two different sets of plated polystyrene surfaces. One set was pre-roughened and then plated while the other set was pre-roughened and chemically modified before plating. Although both sets of surfaces were similarly shaped, a peel strength of 0.4 lb/in was reported for the first set while a value of 5 lb/in was reported for the second set. This indicated the important contribution of chemical bonding to good adhesion.



a) Ideal model, b) real structure.

Figure 3. Diagram of mechanical interlocking mechanism (Source: Heymann, 1970).

Wedel (1977), after reviewing several articles, concluded that both types of bonds (mechanical and chemical) can develop, depending on a number of factors including the chemical composition of the plastic substrate, the etchant gas used and the etching conditions.

2.2 Effect of Surface Porosity on Adhesion

Surface porosity has been found to be a very important factor in adhesion of metal-to plastic. The relationship between surface porosity and adhesion has been discussed by many researchers including Villamizar et al., 1981; Wedel, 1977; Poa et al., 1977.

In Villamizar's study (1981) the mechanism of adhesion between the metal and plastic was studied for two sets of plastic substrates. Each set was treated by a different etchant system. Surface etching was done with either a mixture of chromic and sulfuric acid, or with oxygen plasma. ABS plastic was plated with a continuous, firmly adherent copper deposit. The 90° peel strength test was used to measure the adhesive strength, and average peel strength values (kg/cm) were determined. The plated specimens were also tested for durability by subjecting them to a number of thermal cycling tests. SEM micrographs of the surface of the plastic specimens, shown in Figure 4, were taken before plating. The average pore radius and average number of pores were tabulated for each sample. The conclusion of this study was that the peel strength of the specimens was a function of the surface porosity developed by the etchant.

Wedel (1971) investigated the effect of surface porosity on the ability of ABS moldings to pass thermal cycling tests. He concluded that failure of plated ABS appeared to begin in small areas that had inadequate surface porosity. After initiation, the failure may spread through regions that have adequate surface porosity by a lateral crack propagation mechanism. Another objective of Wedel's study was to explore the extent and influence of surface porosity on the platability of etched polypropylene surfaces, which are similar to etched ABS surfaces. The author concluded that the platability of polypropylene is very dependent on a uniform close packed surface porosity.

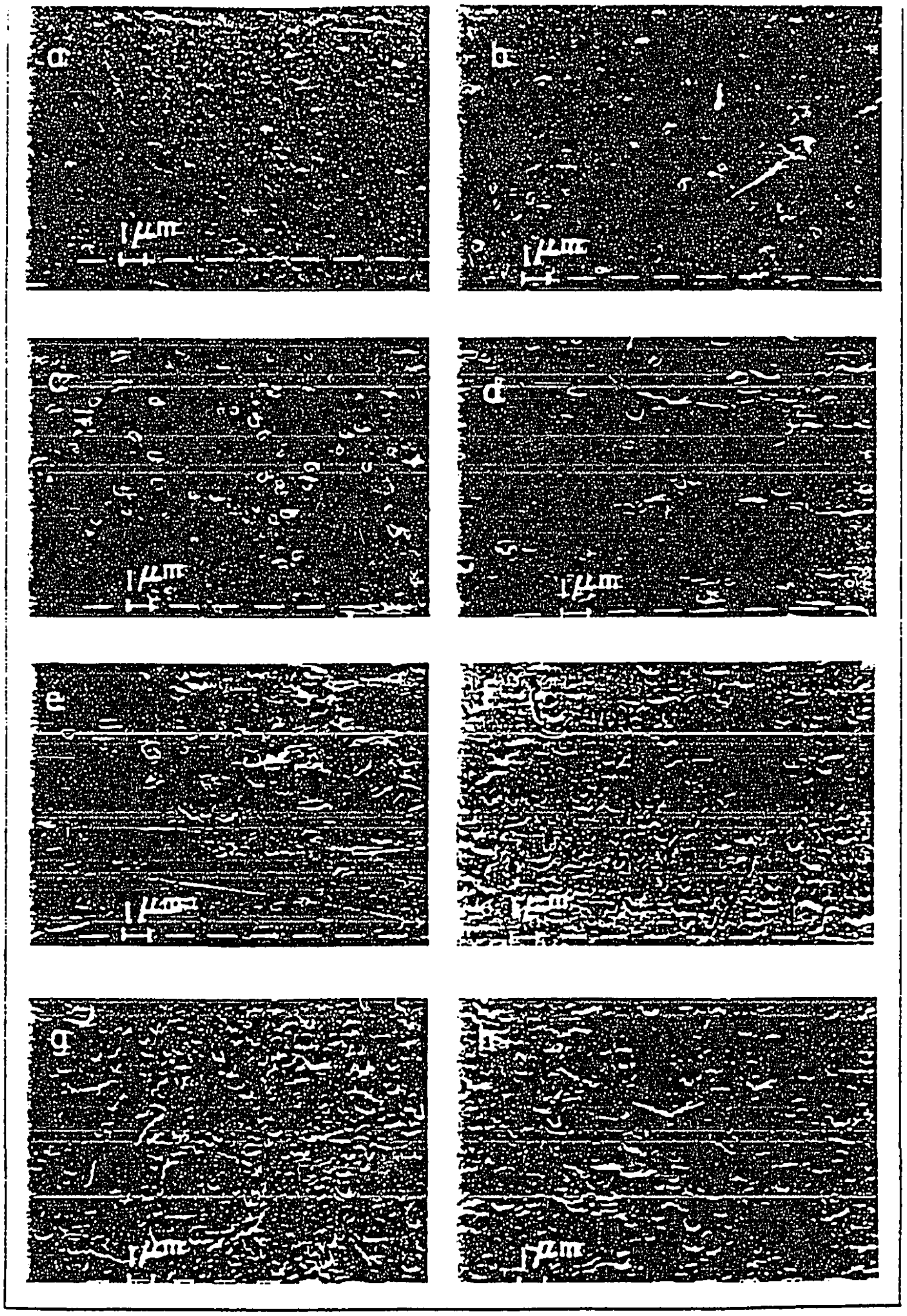


Figure 4. Scanning electron micrographs of ABS surfaces treated with chromic acid Solution 3. (a) untreated, (b) after 30 sec, (c) after 1 min, (d) after 2 min, (e) after 5 min, (f) after 15 min, (g) after 30 min, (h) after 60 min.

Figure 4. Scanning electron micrographs of ABS treated with oxygen plasma for different etching periods (Villamizar et al., 1981).

Poa et al. (1977) studied the quantitative relationship between adhesion and porosity. ABS panels were treated using eight different acid solutions. The resulting surface porosity was observed by SEM. The number of cavities per square centimeter on the surface of ABS panels was counted in each case. SEM micrographs showed that the surfaces of the ABS samples had become porous after etching. The etched cavities, distributed over the ABS surface, were of different sizes and had irregular shapes, although most of the etch pits were roughly circular. The panels were plated with electroless copper, then subjected to a thermal cycle test to measure durability. The influence of surface porosity on the adhesive force between metal and ABS was determined by measuring the durability of adhesion of metal-to-plastic for samples with different surface porosities.

By comparing surface porosity and adhesion durability of each sample, these authors concluded that the characteristics of the microporous openings on ABS plastic surfaces, namely the number of cavities per unit surface area and the uniformity of the cavity size distribution, were some of the most important factors that control metal-to-plastic adhesion. Increasing the number of pores on the plastic surface increased the adhesion between metal and plastic. In the Poa et al. study, the optimal cavity size was reported to be in the range of 0.03-0.2 μm (0.3×10^{-5} - 2.0×10^{-5} cm).

2.3 Plasma Etching Parameters

Several studies have investigated the effect of several plasma etching process parameters on the surface porosity and on the strength and durability of adhesion between metals and plastics (Kaplan, 1987; Villamizar, 1981; McNeil, 1992).

From a review of the literature, Winters et al. (1985) listed those plasma chamber parameters that have been studied as: chamber pressure, types of gas or gases, gas flow rates, residence time, radio frequency power, fixture geometry, fixture materials, and the presence or lack of ion bombardment.

Villamizar et al. (1981) studied the effect of etching period on porosity (pore number and radius) and on peel strength. Results of this study are listed in Table 2. As can be seen, the number of pores, the pore radius and the peel strength are directly related to etching time. The pore number increases as the etching period increases for the first fifteen minutes. The pore radius increases as the etching period increases for the first sixty minutes. The peel strength increases as the etching period increases for the first two minutes.

McNeil and Gurley (1992) studied the effect of oxygen plasma etching parameters on the adhesion of copper to ABS plastic. The effect of four plasma etching parameters on peel strength was studied. The parameters investigated were: oxygen flow rate, etching time, radio frequency power, and etching chamber pressure. Oxygen flow rate and chamber pressure appeared to have the greatest effect on adhesion of copper plating to ABS plastics. It was found that for oxygen flow rates of 20 -100 ml/min., the peel strength was effectively increased by decreasing the oxygen flow rate, as shown in Figure 5. In addition, it was found that the peel strength decreased as the plasma etching chamber pressure increased. Scanning electron micrographs indicated that when the oxygen flow rate increased, the number of pores decreased. However, this effect was not quantified and, therefore, requires further research.

The effect of different types of gases on etching was discussed by Kaplan et al. (1987). The selection of the process gas is one factor which determines how the plasma will alter the plastic. Very aggressive plasmas can be created from relatively benign gases, such as argon or helium. Gases or mixtures of gases used for plasma treatment of plastics include nitrogen, argon, oxygen, nitrous oxide, helium, tetrafluoro-methane, water and ammonia. Each gas produces a unique plasma chemistry. The surface energy can be increased by plasma energy, induced oxidation, nitration, hydrolization, or amination very quickly. Gases which contain oxygen are generally more effective at increasing the surface energy or reactivity. This surface reactivity can affect the bond strength between metal and plastic.

Table 2. Effect of Etching Period of Oxygen Plasma on Adhesion Properties of Copper to ABS (Villamizar et al., 1981).

Etching period	Number of pores	Pore radius (μm)	Peel strength (kq/cm)
5 sec.	-	0.114 + 0.040	0.5 + 0.1
15 sec.	-	-	0.8 0.1
30 sec.	36 + 2	0.134 + 0.063	2.2 0.2
1 min.	39 + 2	0.186 + 0.095	4.5 + 0.5
2 min.	51 + 2	0.240 + 0.146	> 5.5
3 min.	62 + 3	0.259 + 0.186	> 5.5
5 min.	97 + 3	0.289 + 0.226	> 5.5
15 min.	120 + 5	0.378 + 0.320	> 5.5
30 min.	92 + 3	0.601 + 0.315	> 5.5
60 min.	craters	> 1	> 5.5

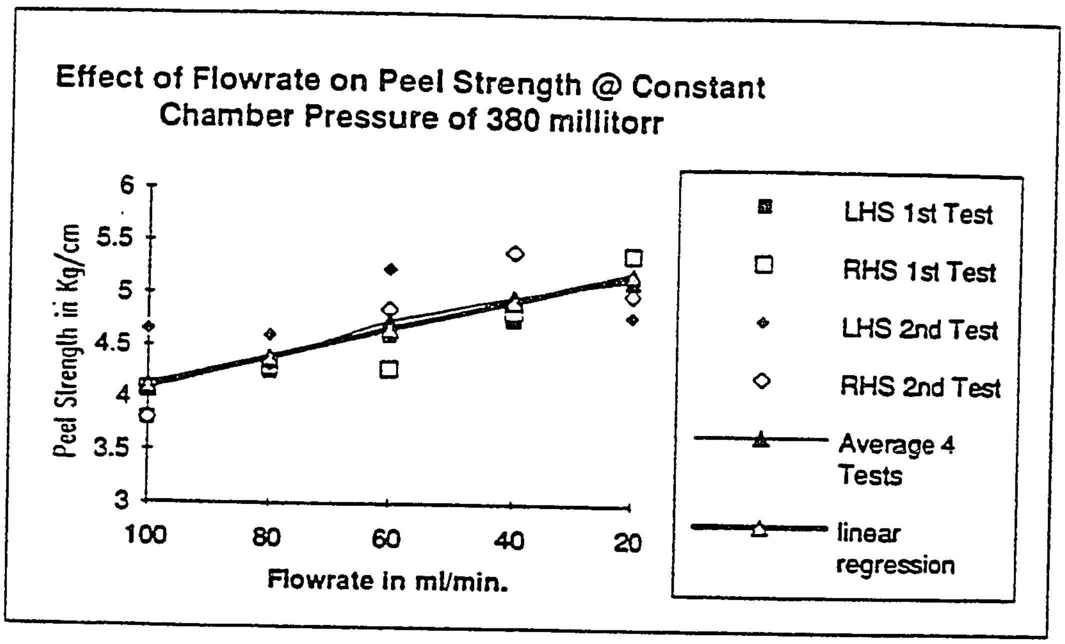


Figure 5. Graph of flow rate of oxygen plasma versus peel strength (Source: McNeil and Gurley, 1992).

As discussed by Hartney et al. (1989), Kaplan et al. (1987) and Buchman et al. (1989), the properties that make a plasma efficient are the dissociation of relatively stable gases into more reactive species and the physical acceleration of ions by the electromagnetic field. The reactive species will chemically react with the surfaces of materials exposed to plasma while the ions can cause bombardment of the surface being etched. While ion energies are one important aspect of the plasma, the other aspects that influence etching are the degree of ionization and the production of neutral species.

Hartney et al. (1988) concluded that often there is a synergistic effect between neutral species and ion bombardment resulting in a faster etch rate when both phenomena occur simultaneously. For highly anisotropic etching, ion bombardment plays a very significant role. When samples were shielded from ion bombardment, no etching occurred. In addition, plastic surface loss was not observed. The author also observed that active species supply is rate limiting for lateral etching. The extent of importance of each one of these factors is generally different for different gases.

Lerner et al. (1988) studied the variation of the etch rate (rate of removal of plastic surface) of selected polymers as a function of the oxygen flow rate in the low range of 2-10 mL/min. The polymers were insulated from ions, electrons and high energy photons bombardment. It was observed that the etch rate of the polymers studied decreased significantly with increasing gas flow rate. It is noteworthy that the same researchers (1989) have reported that increasing the gas flow rate, or decreasing chamber loading, in the presence of ion bombardment leads to an increase in etch rate.

Joubert et al. (1989), in a parametric study of etching of photoresist polymers in a multipolar plasma, showed that atomic oxygen concentration, ion energy and ion bombardment current density are clearly important parameters in the plasma/plastic interaction. The polymer etch rate increased when any of these parameters was increased.

Clark et al. (1977) investigated the cross-linking of an ethylene tetrafluroethylene co-polymer by exposure to argon plasma. He studied the similarity of surface treatment for plasma-modified samples and for samples subjected to low-energy argon ion bombardment at low current. He concluded that the outermost surface reactions are dominated by direct energy transfer from charged and/or metastable species in the plasma.

2.4 Summary

In the plating-on-plastic industry, the most important point is to have good and durable adhesion between the metal and the plastic. In order to achieve this adhesion, understanding of the type of bonds between metals and plastics has been an area of extensive research (Elmore et al.; 1969, Rantell; 1969, and Wedel' 1971). Without reaching an agreement on the types of bonds produced, several researchers have agreed on the importance of surface porosity to good adhesion between metal and plastic (Wedel, 1971; Kato, 1968; and Poa et al., 1977).

Surface porosity was found to be affected by both the type of gas and the type of surface etched. The two etching effects produced by plasmas on plastic surfaces were reported to be chemical and ion bombardment, as discussed by Hartney et al. (1988) and Joubert et al. (1989).

Surface porosity, as well as the strength of adhesion between the metal and plastic were found to be affected by various plasma etching parameters (Poa et al., 1977; Kaplan, 1987; Villamizar et al., 1981; and McNeil et al., 1992). The surface porosity of ABS was found to be affected by different plasma etching parameters. Several researchers (Villamizar et al., 1981; Lerner et al., 1989; and McNeil et al., 1992) have studied the effect of plasma etching parameters on the surface porosity of ABS plastics. One parameter which was shown to affect the surface porosity, but was not quantified, was gas flow rate.

The objective of this study is to investigate the relationship between gas flow rate and number and size of pores produced during ABS plasma etching processes using two different gases, oxygen and helium.

3.0 RESEARCH HYPOTHESIS AND OBJECTIVE

3.1 Hypotheses

There is a relationship between the plasma gas flow rate and the number and the diameter of pores etched on an ABS plastic surface. Oxygen, as a polar oxidizing agent, and helium as an inert gas, produce different plasma chemistries and, hence, will have different effects on the number and size of pores etched on ABS plastic surfaces.

3.2 Objective

To investigate the relationship between the plasma gas flow rate, and the number and the diameter of pores etched on ABS plastic during plasma etching. A comparison of the results obtained using oxygen gas plasma and helium gas plasma was undertaken.

4.0 EXPERIMENTAL DESIGN AND APPARATUS

4.1 Plasma Etching

Plasma etching was performed on ABS plastic samples with oxygen or helium plasma, using a March CS-1701 plasma etcher. (Appendix A describes the plasma etcher). High purity gases (99.99%) were obtained from Linde Gases.

ABS samples were obtained from GE plastics. These samples were made of acrylonitrile-butadiene-styrene resin and had dimensions of 76.5 mm x 101.6 mm x 3.17 mm.

Samples were cleaned using a high phosphate soap (Alconex) containing no animal fat before etching. As shown in Table 3, samples were etched at a constant chamber pressure of 380 millitorr, constant RF power of 50 Watts and constant etching time of 10 minutes. The gas flow rate was varied over the range of 25 - 100 ml/min. Two samples were etched at each gas flow rate for each gas. The etched samples were cut into sizes of 12.3 mm x 3.17 mm for Scanning Electron Microscopy. To determine reproducibility, this process was repeated for selected conditions, as shown in Table 3.

4.2 Scanning Electron Microscopy

The plasma etched samples were sputtered with a layer of 125 angstroms of gold to provide the surface conductivity. The gold sputtered samples were photographed using a Hitachi S-520 Scanning Electron Microscope. Several photographs were taken for each sample. Due to the nature of the surface, a magnification of 15,000 was used for all SEM analysis. Randomly chosen unetched samples were also photographed by the same method. The SEM photographs of the unetched samples were analyzed to specify the surface porosity of the samples before etching.

Table 3. Plasma etching experimental design matrix

Basic Experiments					
Type of Gas	No. of Samples	Control Factors			
		A	B	C	D
Oxygen	2	100	10	50	380
	2	75	10	50	380
	2	50	10	50	380
	2	25	10	50	380
Helium	2	100	10	50	380
	2	75	10	50	380
	2	50	10	50	380
	2	25	10	50	380
Reproducibility Experiments					
Oxygen	1	25	10	50	380
Helium	1	25	·10	50	380

Where:

A: Gas flow rate in ml/min.

B: Etching time in minutes

C: Radio frequency power in Watts

D: Chamber pressure in millitorr

4.3 Data Analysis

In an attempt to have a clear understanding of the porosity on the etched sample's surface, all the pores appearing on the SEM photograph were retraced onto grid paper consisting of a number of intersecting parallel lines of scale 10 x 10 per cm. Four photographs of each sample were retraced.

The effect of etching on the ABS surface was analyzed using three different measurements, one of which was the number of pores. The method used to determine the number of pores counted whole pores within a known test area (A_r). This area, A_r, was taken to be a full micrograph. Each pore fully within the border was marked off and numbered. The number of whole pores counted per micrograph is N_i. The average number of pores at each flow rate, N_j, measured for n equal test areas, can be expressed as

$$N_j = \frac{1}{n} \sum_{i=1}^{n} N_i \qquad [1]$$

The standard deviation, S, of the N_j measurements was determined as follow:

$$S = \sqrt{\left[\frac{1}{n-1} \sum_{i=1}^{n} \left(N_i - N_j\right)^2 \right]} \qquad [2]$$

The testing area (A_r) was equal for all micrographs since the whole area within a micrograph was considered to be the testing area and the magnification was kept the same. Magnified micrographs has an actual area of $12 \times 10^4 \times 9 \times 10^4$ μm^2.

The second type of measurement made was the diameter of the pores D_i. Considering the shape of most of the pores, which is roughly elliptical, two diameters were measured for each pore, the maximum diameter, D_{xi}, and the minimum diameter, D_{mi}. The D_{xi} or D_{mi} value was obtained by dividing the apparent length on the SEM micrograph by the magnification, M. The magnification for all photographs was 15,000. The average diameter of each pore, D_i, was calculated as follows:

$$Di = \frac{Dxi + Dmi}{2} \qquad [3]$$

The average diameter for all pores for each micrograph, D_j, was then calculated as follows:

$$D_j = \frac{1}{n} \sum_{i=1}^{n} D_i \qquad [4]$$

The average diameter for all pores for each flow rate, D_k, was calculated as follows:

$$D_k = \frac{1}{m} \sum_{j=1}^{m} D_j \qquad [5]$$

where:

m: the number of pores per micrograph, and

n: number of micrographs analyzed for each flow rate

The standard deviation, S, of the average diameter, D_j, was determined by

$$S = \sqrt{\left[\frac{1}{n-1} \sum_{j=1}^{n} \left(D_j - D_k\right)^2 \right]} \qquad [6]$$

The third type of measurement was the plane surface area, A_j, of the pores in each micrograph. This area was calculated using the average diameter of each pore as follows:

$$A_j = \sum_{i=1}^{m} \left(\frac{\pi}{4} \times D_i^2 \right) \qquad [7]$$

The plane surface area was averaged over all micrographs at each flow rate using equation 8.

$$A_k = \frac{1}{n} \sum_{j=1}^{n} A_j \qquad [8]$$

This area was calculated to obtain the approximate plane area of the pores per micrograph. The area A_k was divided by the test area, A_r, in order to calculate the fractional etched area of the surface, A_f. Both A_k and A_r areas were taken at the unmagnified (true) value, by dividing the observed area by the magnification.

These calculations were repeated for each gas flow rate for both oxygen and helium.

5.0 RESULTS AND DISCUSSION

5.1 Introduction

This section presents and discusses the results obtained from the experiments performed in this investigation. The average number of pores and the minimum, maximum and average diameter distribution versus oxygen or helium flow rate are presented. Data tables containing the results used to plot the figures shown in this chapter are presented in Appendix C and D for oxygen and helium, respectively.

5.2 Blank Sample Topography

Figure 6 shows the surface topography of an unetched sample. This figure is presented so that a comparison of etched and unetched topographies can be made. As shown in this micrograph, the unetched surface contains a few pores on non adjacent locations of the surface.

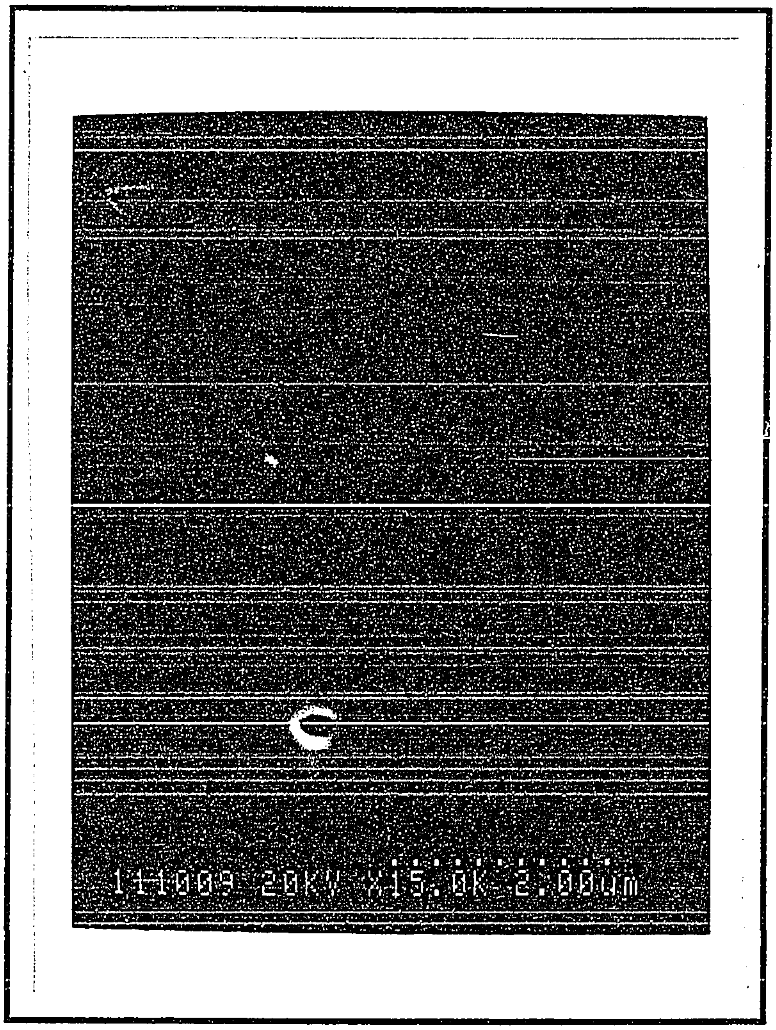


Figure 6. Topography of an unetched ABS sample.

5.3 Oxygen Plasma Topography

Several SEM micrographs of the etched ABS surface were taken at different sample locations for each oxygen flow rate. Only small variances in surface topography were noted at any specific flow rate. Typical micrographs are shown in Figures 7 through 10, for ABS samples etched at a flow rate of 25 mL/min, 50 mL/min, 75 mL/min, and 100 mL/min, respectively. An examination of these figures shows an increase in the number of pores as the oxygen flow rate increases. Traces of each SEM micrograph, made according to the procedure described in section 4.3, are presented in Appendix B. All pore measurements were made using these traces. The averaged pore data consists of data measured from four micrographs at each flow rate.

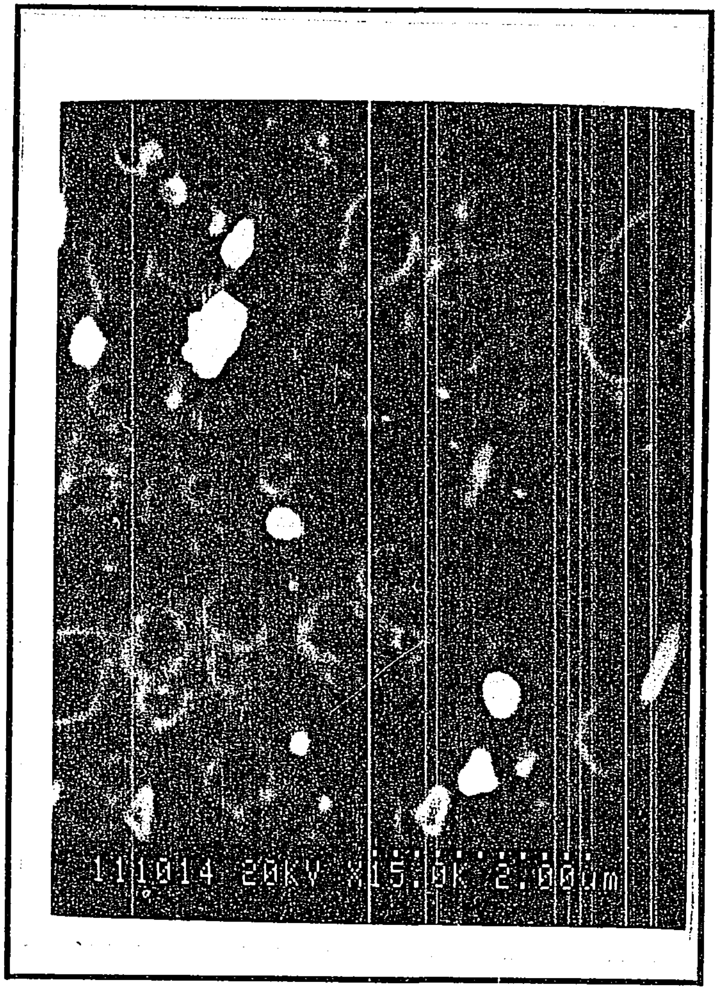


Figure 7. Sample etched with oxygen at a flow rate of 25 mL/min.

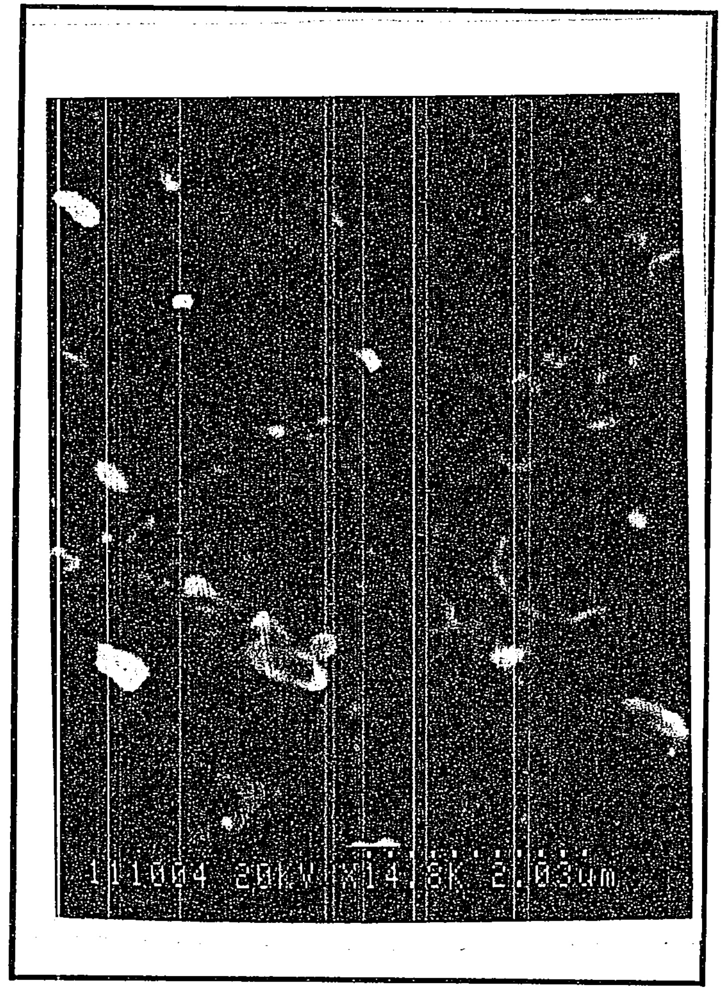


Figure 8. Sample etched with oxygen at a flow rate 50 mL/min

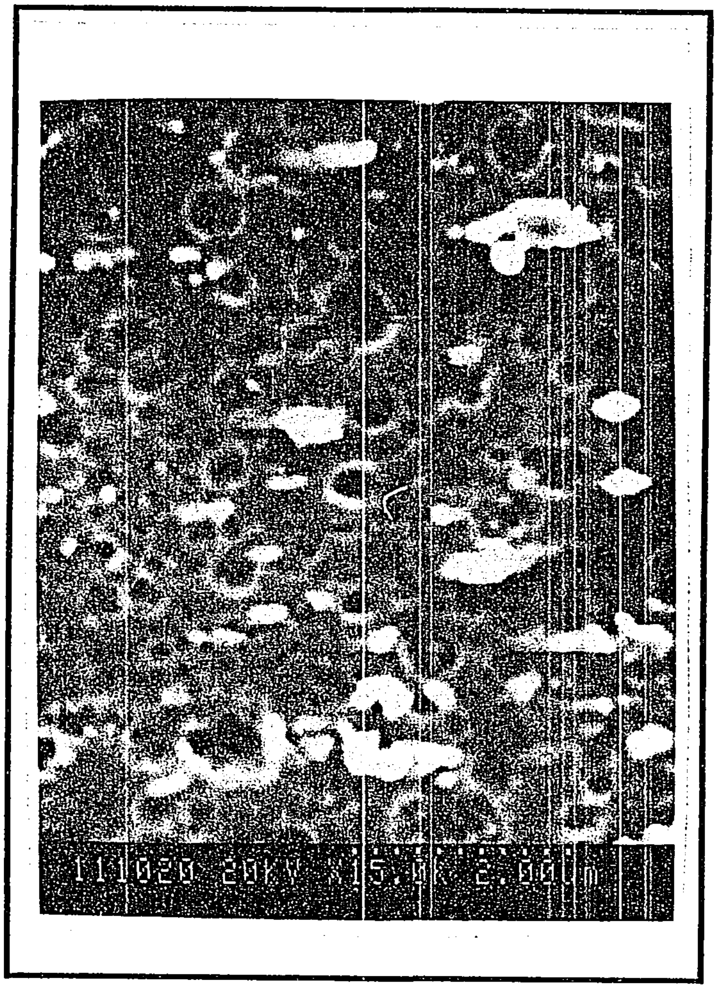


Figure 9. Sample etched with oxygen at a flow rate 75 mL/min.

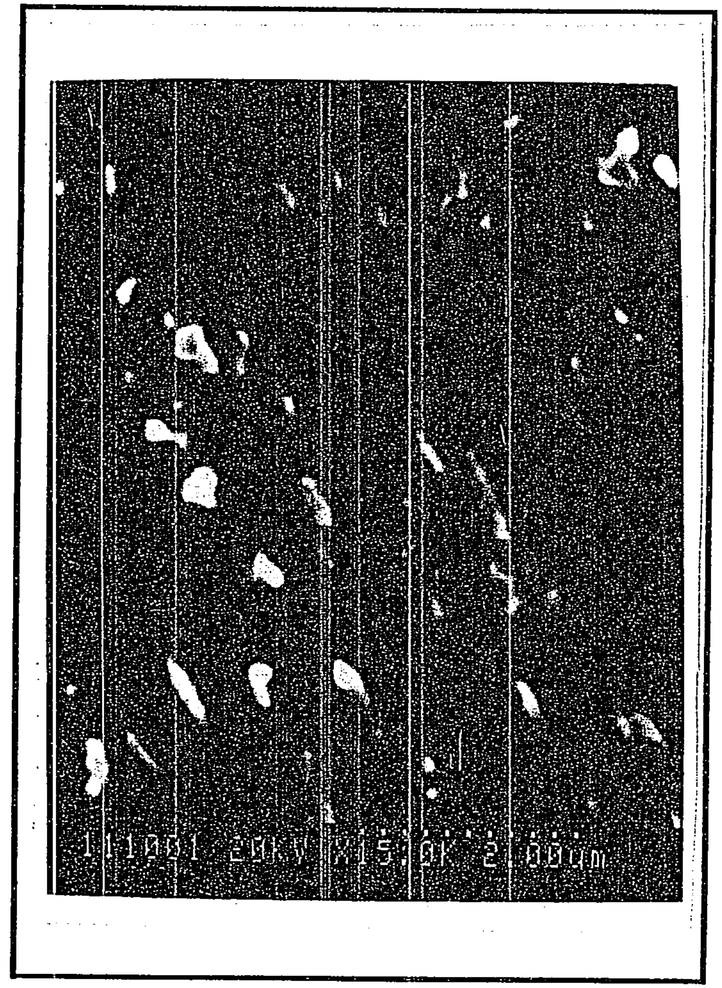


Figure 10. Sample etched with oxygen at a flow rate of 100 mL/min.

5.4 Oxygen Etching: Number, Diameter and Average Plane Surface Area of Pores

The average number of pores versus gas flow rate is plotted in Figure 11. The average number of pores increases as the oxygen gas flow rate increases. This agrees with the results found by Lerner et al. (1989). This increase is of higher magnitude at higher flow rates. Increasing the gas flow rate from 25 to 50 mL/min caused a 40 percent increase in the number of pores, while increasing the gas flow rate from 75 to 100 mL/min caused a 52 percent increase in the number of pores.

For each micrograph, the minimum and maximum pore diameters were measured for each pore. The average pore diameter was calculated for each micrograph as D_j, and for each flow rate as D_k, as described in section 4.3. The average pore diameter, D_k, is plotted as a function of oxygen gas flow rate in Figure 12. The error bar at each data point indicates the range in the number of pores obtained at each flow rate. As can be seen, the average pore diameter decreases as the gas flow rate increases.

Maximum diameter/Minimum diameter distribution histograms showed a similar distribution for each gas flow rate. A typical histogram is shown in Figure 13. This figure shows that some of the pores have elliptical and circular geometrys. However, most of them are at least nearly circular, and therefore using an average for diameter, D_k, is an acceptable approximation in the presentation and discussion of the results which follow.

The average pore diameter distributions, obtained from four micrographs at each flow rate, are plotted as histograms as shown in Figures 14 through 17. In all of these histograms, the ranges of the pore diameters were taken as: 0-0.099, 0.1-0.199, etc. Due to graphs space limitations, the graph scale ranges are written as: 0-0.1, 0.1-0.2, etc.

The results obtained for the number and the average pore diameter can be explained by considering that the porosity of the surface is a result of a combination of

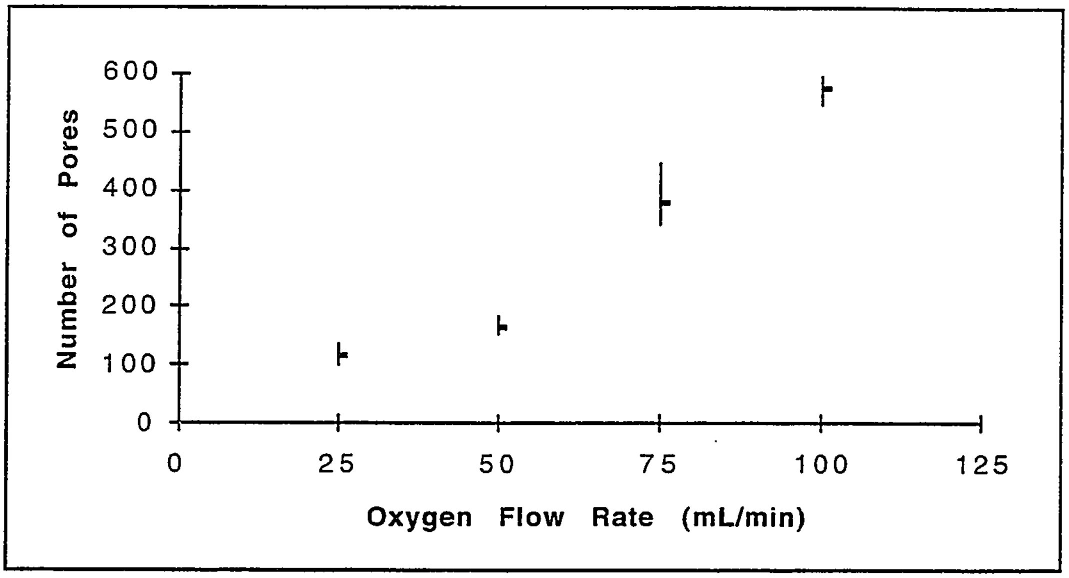


Figure 11. Average number of pores versus gas flow rate for oxygen plasma etching.

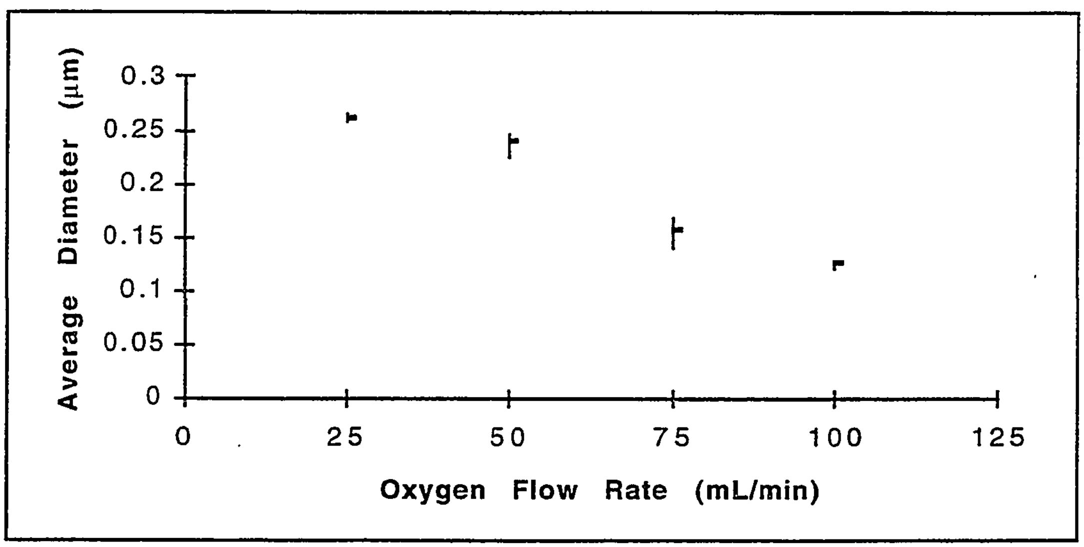


Figure 12. Average pore diameter versus gas flow rate for oxygen plasma etching.

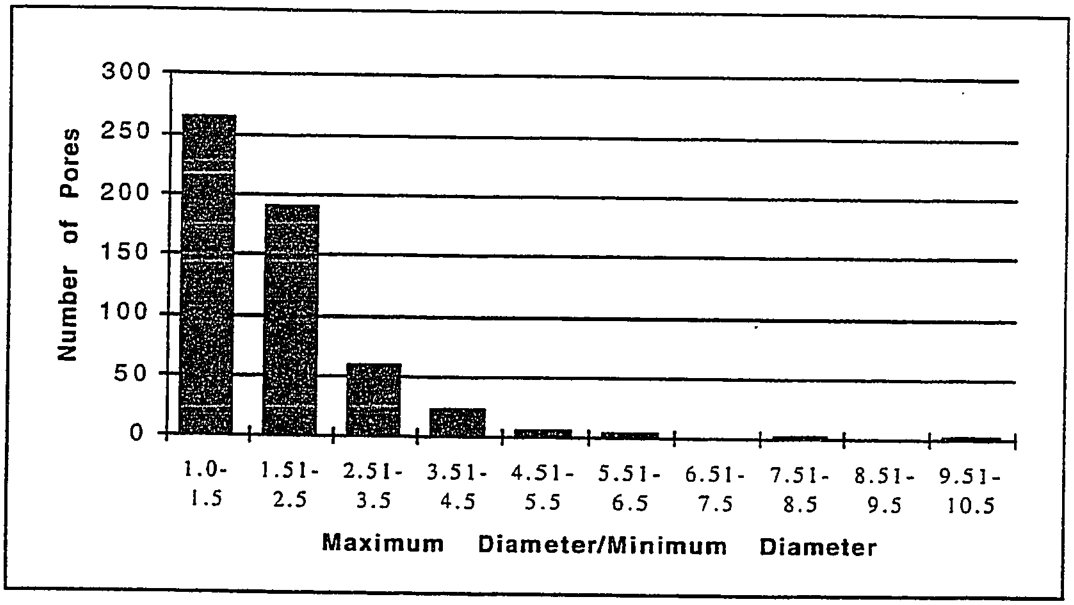


Figure 13. Maximum diameter/ minimum diameter distribution for pores obtained by etching with oxygen gas.

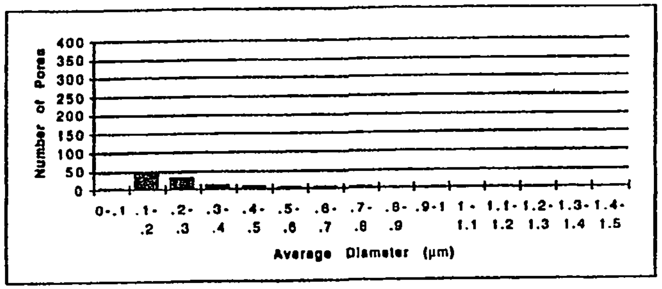


Figure 14. Average pore diameter distribution for samples etched with oxygen at a flow rate of 25 mL/min.

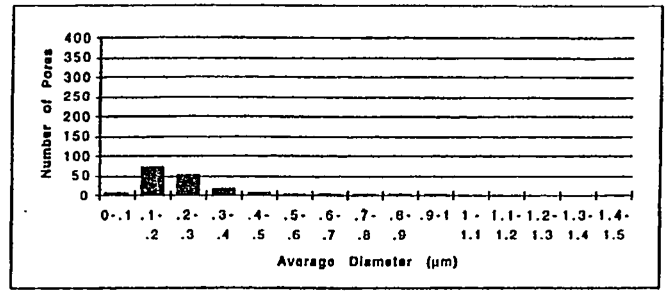


Figure 15. Average pore diameter distribution for samples etched with oxygen at a flow rate of 50 mL/min.

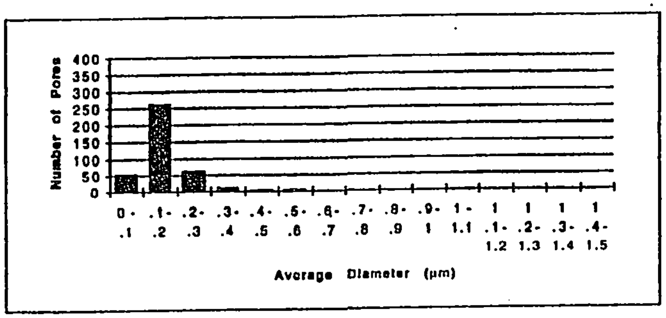


Figure 16. Average pore diameter distribution for samples etched with oxygen at a flow rate of 75 mL/min.

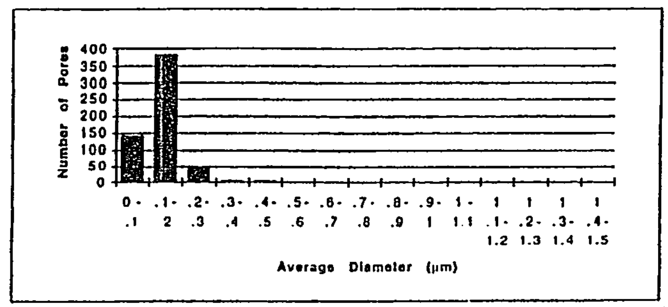


Figure 17. Average pore diameter distribution for samples etched with oxygen at a flow rate of 100 mL/min.

both lateral etching and vertical etching. In other words, a combination of purely chemical etching and etching resulting from ion bombardment, as described by Hartney et al., 1988, and Bachman et al., 1989.

Increasing the gas flow rate reduces chemical etching and increases ion bombardment. Lerner et al. (1988) showed that in the absence of ion bombardment, chemical etching decreases as gas flow rate increases. This results from the fact that higher gas flow rates decrease the residence time of the gas resulting in quicker removal of volatile species and products and, thus, less reaction. The active species supply has been reported to be the rate limiting factor for chemical etching (Hartney et al., 1988). Ion bombardment creates more of a vertical etching effect, generating what has been called "surface damage" porosity.

The different topography produced by each type of etching can be seen in the Atomic Force Micrographs (AFM) taken for samples etched with oxygen plasma at 25 and 100 mL/min, as shown in Figures 18 and 19, respectively. The same type of surface topographies were observed by Greenwood et al. (1993) for polystyrene samples etched at different oxygen flow rates. The differences in topography can be explained by considering that they result from a combination of chemical etching and ion bombardment etching. The low number of pores with wide diameters and shallow depths shown at the low gas flow rate are typical of those obtained from chemical etching. The greater number of pores with smaller diameters and greater depths seen at the higher flow rate are typical of those obtained from ion bombardment etching.

For samples etched with low oxygen flow rates, chemical etching has a larger contribution due to the reactions of the active gas species with the plastic surface. Oxygen plasma, as described by Kaplan et al. (1990), is aggressive and forms a large number of different species such as O^+, O^-, O_2^-, O, O_3, ionized ozone, metastable exited O_2, and free electrons. As the gas components recombine, they release energy and photons, emitting UV radiation. The photons in the UV region have enough energy to break the carbon-carbon and carbon-hydrogen bonds of the plastic in reactions of the type that follows (Kaplan, 1990):

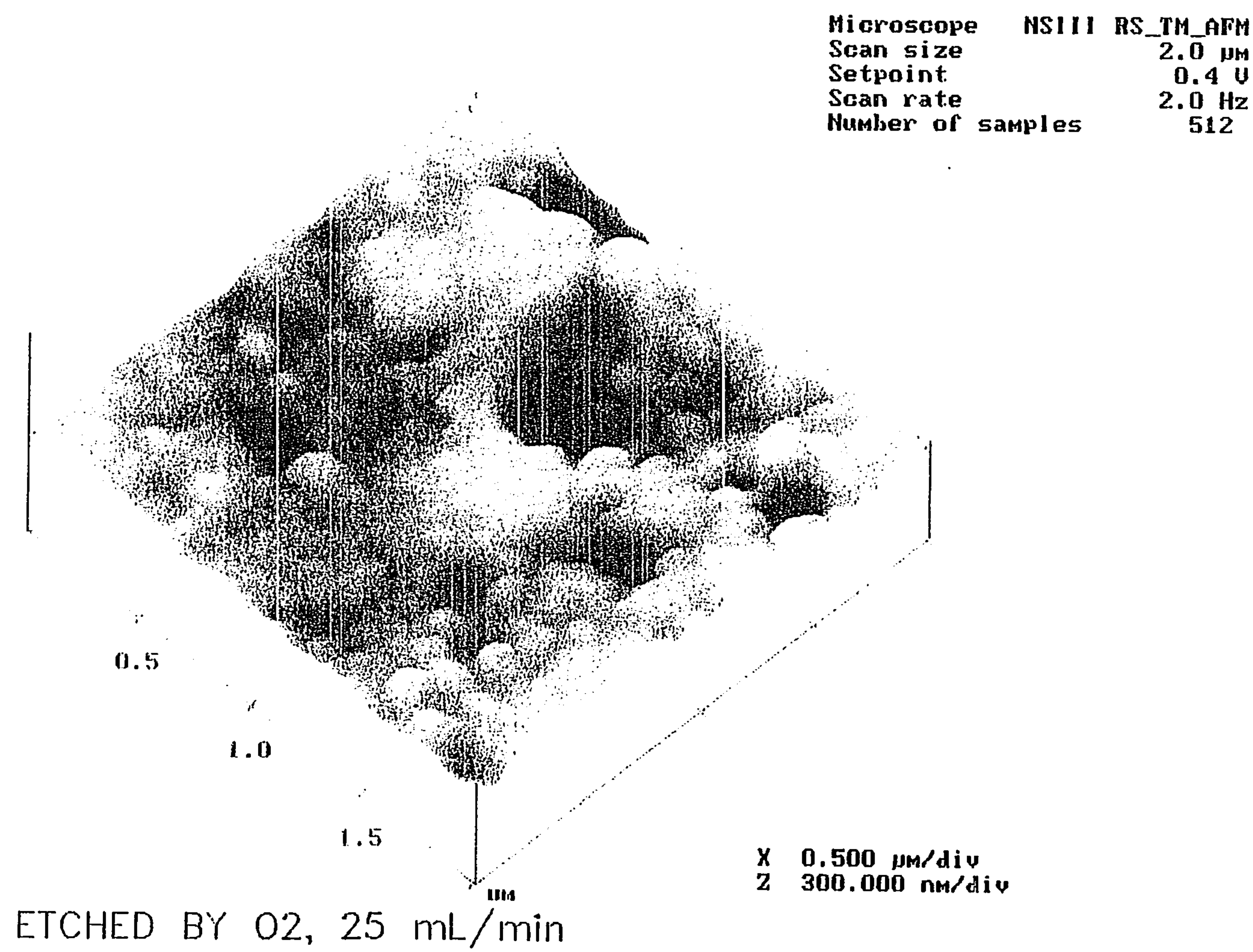


Figure 18. Atomic force micrograph for a sample etched with oxygen plasma at a flow rate of 25 mL/min.

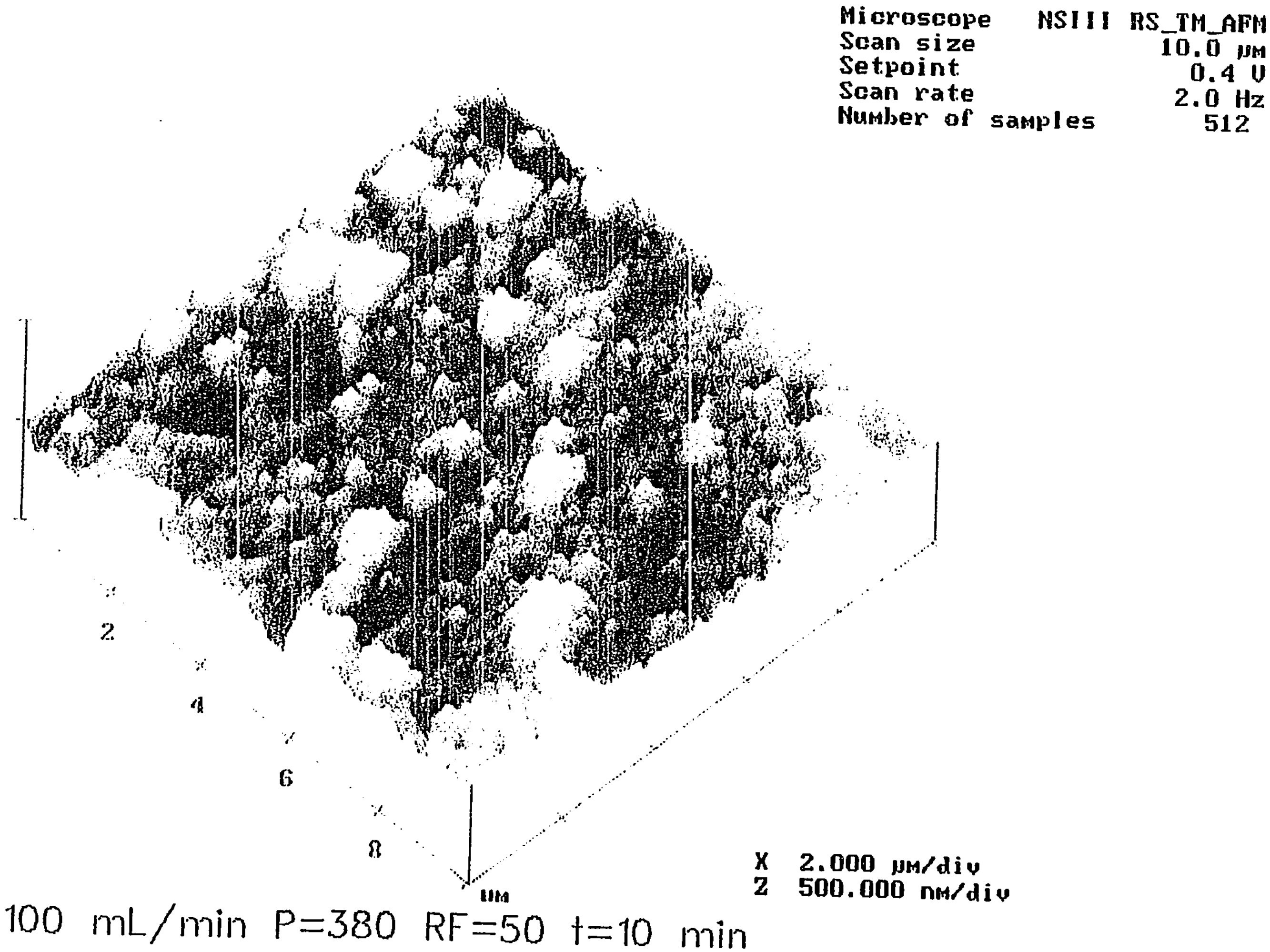


Figure 19. Atomic force micrograph for a sample etched with oxygen plasma at a flow rate of 100 mL/min.

$$RH + O\cdot \rightarrow R\cdot + OH\cdot \quad (1)$$

$$RH + 2O\cdot \rightarrow R\cdot + H\cdot + O_2 \quad (2)$$

$$RH \xrightarrow{UV} R\cdot + H\cdot \quad (3)$$

where R is used to represent any carbon containing component making up the plastic surface. All of the active species can react with the plastic. In addition, the plastic is bombarded by photons, ions and neutral particles. The reactions contribute to chemical (lateral) etching and the bombarding particles contribute to ion bombardment (vertical) etching.

The combination of each type of etching produced by the gas flow rate on both the number and the diameter of pores can be accounted for by considering the total plane surface area of pores created at each flow rate of oxygen. The plane surface area of each pore was calculated using the average pore diameter as described in section 4.3. The average fractional pore area, Af, etched on the surface was calculated by dividing the total plane surface area of pores present in a tested area by the total tested area. The average plane surface area was plotted as a function of flow rate, and is shown in Figure 20. This figure shows that the fractional etched surface area increases as the gas flow rate increases, until it reaches a maximum value at a flow rate of 50 mL/min, and then decreases as the flow rate increases further. If chemical etching was dominant at low flow rates, and both types of etching were significantly contributing at 50 mL/min, this could account for the fact that there is a maximum in the plot of Af versus oxygen flow rate at this value. Chemical etching then becomes more negligible at higher gas flow rates. At the lower gas flow rate, the contribution from chemical etching generates wider pores. At the highest gas flow rate ion bombardment results in a fractionally etched surface area which is less than that produced at 25 mL/min flow rate by chemical etching. The presence of a transitional region where both types of etching would significantly contribute, can therefore be expected. For surface area obtained from each photograph refer to Appendix A.

The greatest etched surface area does not necessarily mean good adhesion between metal and plastic will be achieved. The results obtained by McNeil et al.

(1992), showed a linear decrease in peel strength with increasing gas flow rate, in the range of 20 - 100 mL/min, as can be seen in Figure 5. The adhesion between metal and plastic monotonically decreased over the oxygen gas flow rate range, which included that used in the current study. Conceivably this may be a result of the active species produced from chemical etching on the surface. The presence of active species may result in stronger chemical bonds between metal and plastic than where those active species are not present, such as when ion bombardment is dominant.

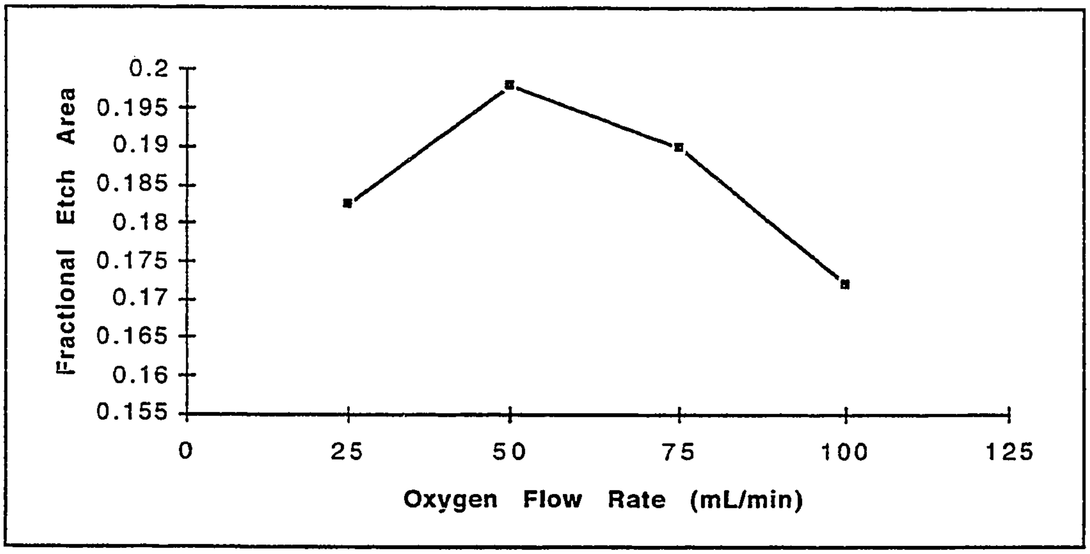


Figure 20. Average fractional plane surface area of pores versus gas flow rate for oxygen plasma etching.

5.5 Helium Plasma Topography

Four micrographs of the etched ABS surface were taken at different locations at each helium flow rate. As was the case with oxygen gas, different micrographs taken for any individual flow rate show only a small variance in surface topography. Typical micrographs for samples etched at a flow rate of 25 mL/min, a flow rate of 50 mL/min, a flow rate of 75 mL/min, and a flow rate of 100 mL/min are shown in Figures 21 through 24, respectively. As can be seen, the number of pores increases as the gas flow rate increases. Another phenomena that can be observed is the formation of grains of groups of pores, (several small pores contained within a large pore boundry), at higher gas flow rates. Appendix B shows traces made of all SEM micrographs of samples etched with helium. All the measurements were made using these traces.

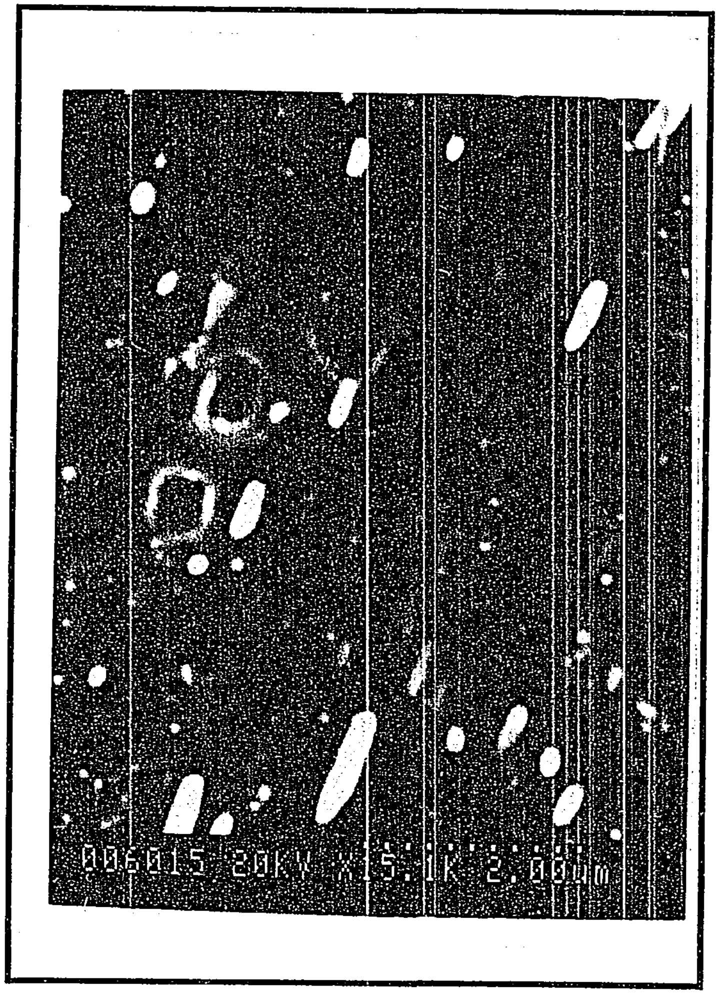


Figure 21. Sample etched with helium at a flow rate of 25 mL/min.

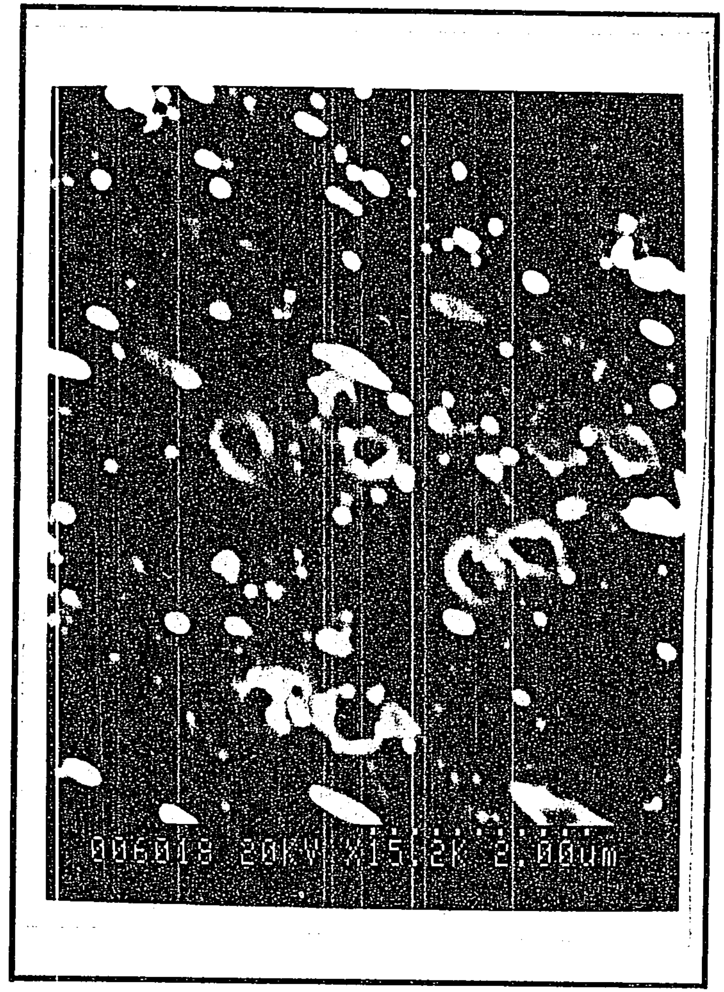


Figure 22. Sample etched with helium at a flow rate of 50 mL/min.

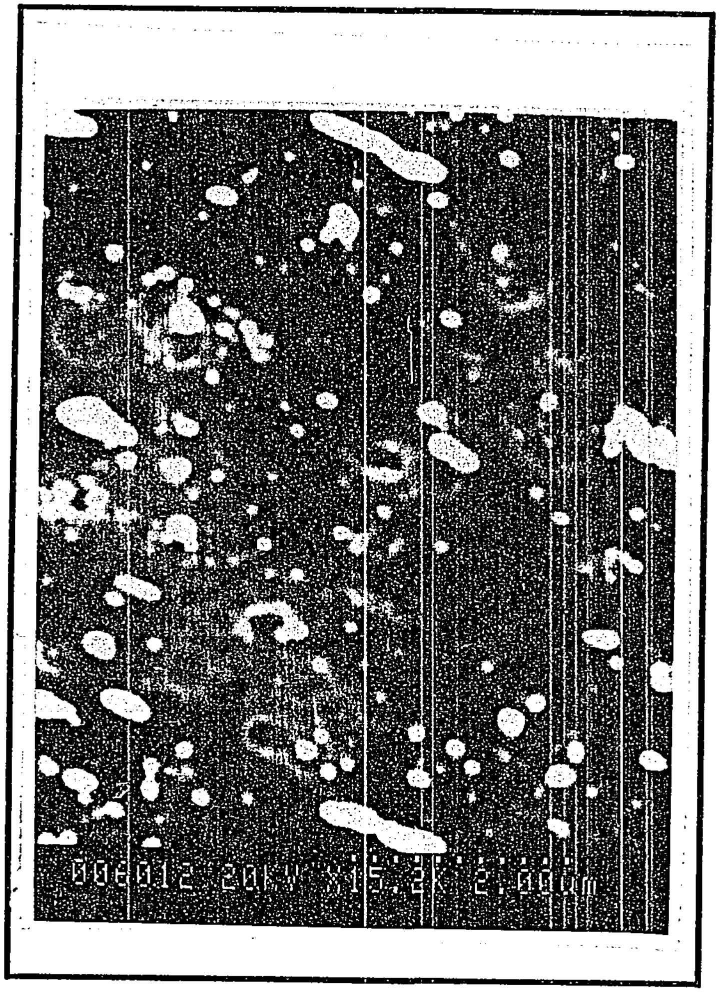


Figure 23. Sample etched with helium at a flow rate of 75 mL/min.

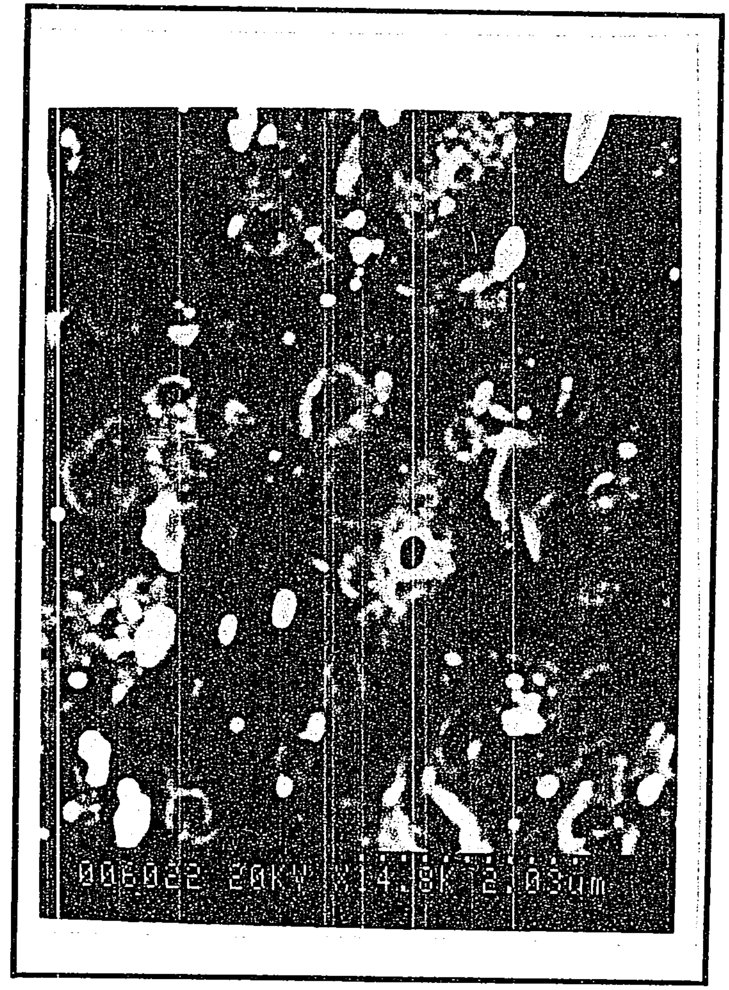


Figure 24. Sample etched with helium at a flow rate of 100 mL/min.

5.6 Helium Etching: Number, Diameter and Average Plane Surface Area of Pores

The number of pores in each micrograph, in addition to the average number of pores for each flow rate, were calculated as described in Section 4.3. The average number of pores versus helium gas flow rate is plotted in Figure 25. The average number of pores increases as the helium gas flow rate was increased. Increasing the gas flow rate from 25 to 50 mL/min increased the number of pores by 38 percent, while increasing the gas flow rate from 75 to 100 mL/min increased the number of pores by 48 percent.

The average pore diameter was calculated for each micrograph and for each flow rate, as described in Section 4.3. The average pore diameter versus gas flow rate is plotted in Figure 26, with a bar indicating the range of values obtained at each flow rate. This figure shows that the pore diameter decrease as the gas flow rate was increased.

Figure 27 is a typical distribution histogram of the ratio Maximum diameter/Minimum diameter. This figure shows that some of the pores are elliptical. However, as was the case for oxygen etching, most of the pores are nearly circular and, thus, the use of the average diameter in the following calculations was considered to be an acceptable approximation.

The average pore diameter distribution for each flow rate, averaged over four micrographs, is plotted as histograms in Figures 28 through 31. In all of these histograms, the diameter range scale on the abscissa has the same criteria as those described for the oxygen histograms presented in section 5.4.

The theory that a combination of chemical reaction and ion bombardment etching occurs can explain the effect of helium plasma etching on the plastic surface. Ion bombardment seems to make a significant contribution at all flow rates. The effect of ion bombardment etching is indicated by the existence of a greater number of pores with smaller average diameters, even at the lowest gas flow rate of 25 mL/min.

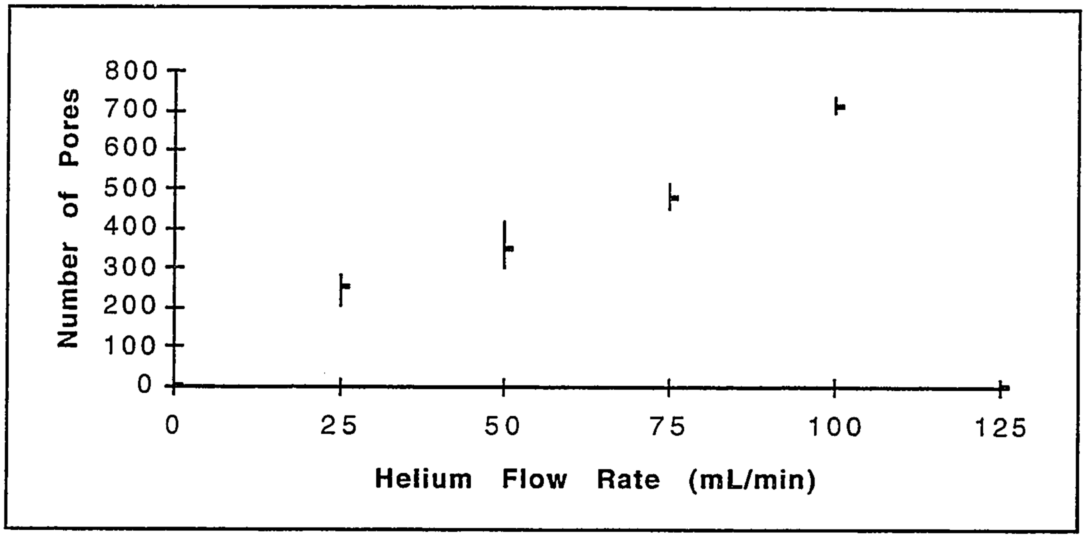


Figure 25. Average number of pores versus gas flow rate for helium plasma etching.

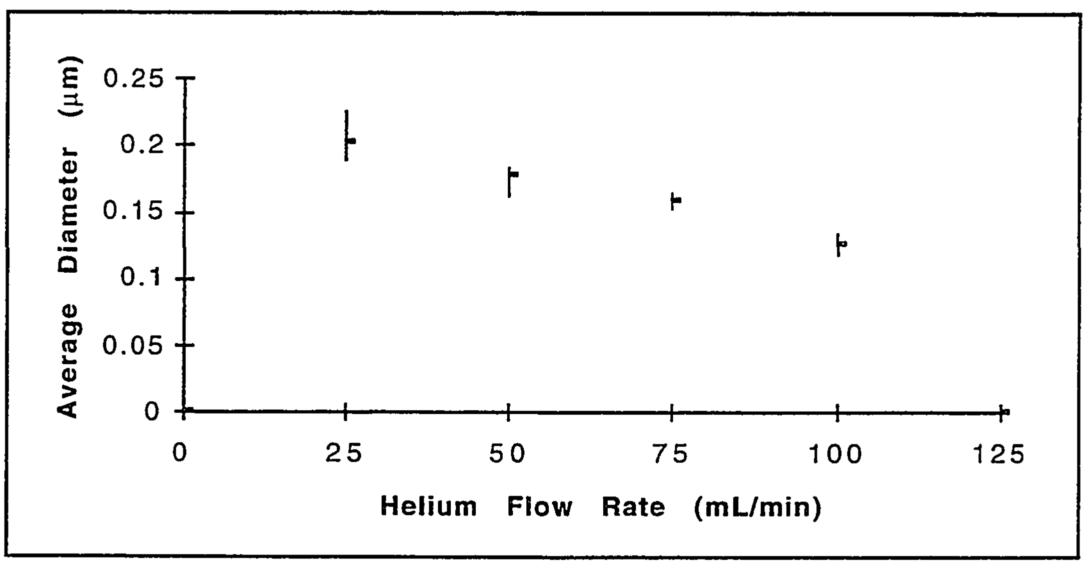


Figure 26. Average pore diameter versus gas flow rate for helium plasma etching.

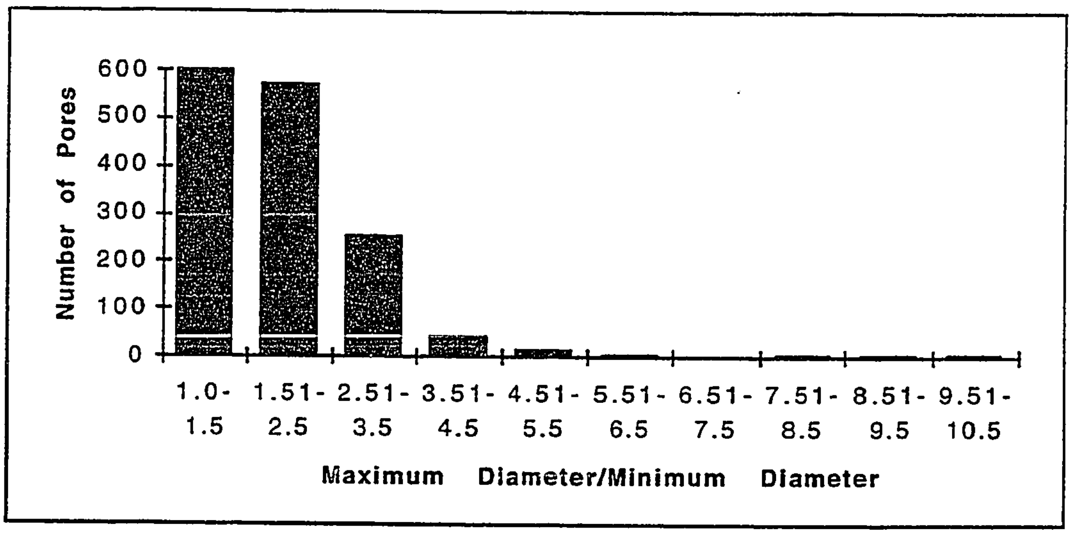


Figure 27. Maximum diameter /minimum diameter distribution for pores resulted from etching with helium gas.

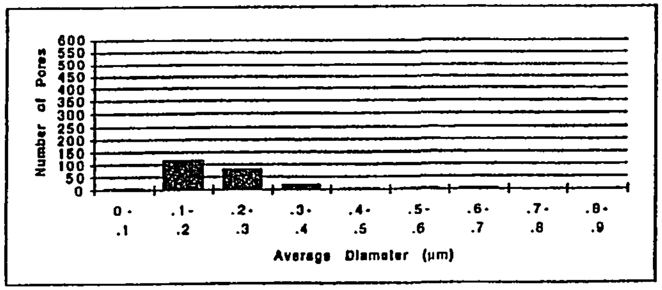


Figure 28. Average pore diameter distribution for samples etched with helium at a flow rate of 25 mL/min.

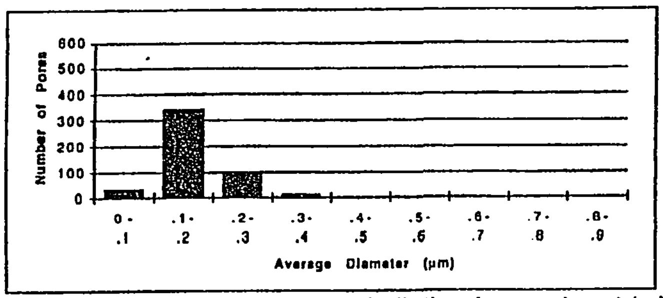


Figure 30. Average pore diameter distribution for samples etched with helium at a flow rate of 75 mL/min.

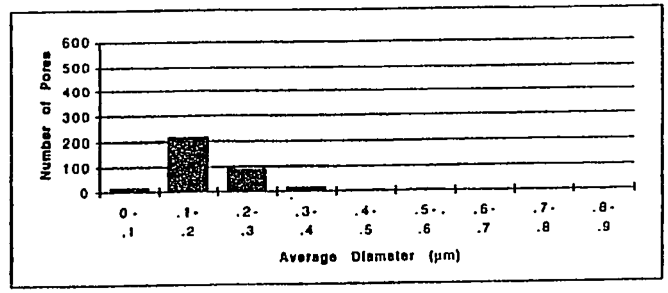


Figure 29. Average pore diameter distribution for samples etched with helium at a flow rate of 50 mL/min.

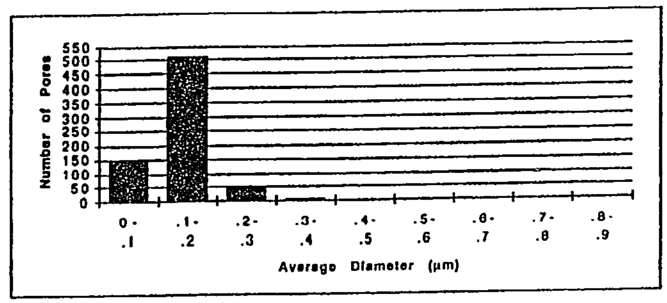


Figure 31. Average pore diameter distribution for samples etched with helium at a flow rate of 100 mL/min.

Chemical etching also contributes at lower gas flow rates. The concentration of active species is greater at low flow rates, and surface chemical reactions can take place since the residence time is relatively long. However, the fact that helium etching is generating more pores with smaller diameters than oxygen shows a greater effect of ion bombardment for helium than was the case for oxygen.

For inert gases, the surface reactions that have been observed by Kaplan et al. (1987), Clark et al. (1977), and Schonhorn et al. (1967), starts with ablation, an evaporation reaction in which the energy imparted to the surface from the plasma breaks the bonds that hold volatile components in place. The reactions that follow could be unsaturation in which molecules can react with an adjoining radical on the same chain, forming a double or triple bond, and/or crosslinking in which molecules can form a bond with a nearby free radical on a different chain. Schonhorn et al. (1967) studied possible surface reactions occurring on plastic surfaces when they were bombarded with ionic or metastable species of helium. Some proposed reactions are:

$$R_1H + He^* \rightarrow R_1H^* + He \qquad (1)$$
$$R_1H^* + R_2H^* \rightarrow R_1R_2 + H_2 \qquad (2)$$
$$He^* + RH \rightarrow R\cdot + H\cdot + He \qquad (3)$$
$$He^* + R_1R_2 \rightarrow R_1\cdot + R_2\cdot + He \qquad (4)$$
$$H\cdot^* + RH \rightarrow H_2 + R\cdot \qquad (5)$$
$$R\cdot + R_1\cdot \rightarrow RR_1 \qquad (6)$$
$$R\cdot + R_2\cdot \rightarrow RR_2 \qquad (7)$$
$$R\cdot + R\cdot \rightarrow RR \qquad (8)$$

where R represents any carbon containing species on or from the plastic surface. At lower gas flow rates some of these reactions probably occur in conjunction with ion bombardment. Increasing the flow rate has two effects: it causes an increase in vertical etching, as represented by the increase in number of pores, and a decrease in chemical etching, as represented by the decrease in pore diameter.

The average fractional plane surface area of pores was calculated and plotted as a function of gas flow rate as shown in Figure 32. The average fractional surface area increases with increasing gas flow rate, up to 75 mL/min, probably due to the creation of more pores. Increasing the gas flow rate from 75 to 100 mL/min decreases the average fractional surface area. This phenomena might have a connection with the grain formation that was observed on the SEM micrographs at the same flow rate range. Those grains contain large number of very small pores. However, further investigation is necessary to evaluate this observation. The average fractional surface area produced at the highest flow rate of 100 mL/min is still more than that produced by the lowest gas flow rate. For calculations of the surface area obtained from each photograph refer to Appendix D.

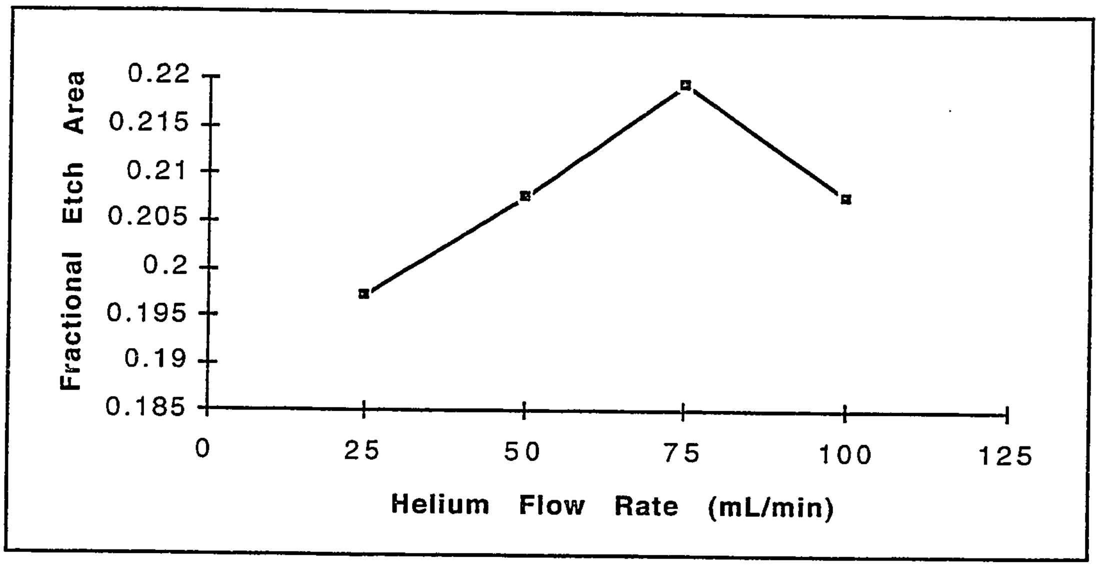


Figure 32. Average fractional plane surface area of pores versus flow rate for helium plasma etching.

5.7 Combined Data: Comparison and Discussion

For comparison reasons, the average number of pores was plotted as a function of gas flow rate for both oxygen and helium in Figure 33. As can be seen, helium plasma etching produced a larger number of pores than oxygen plasma etching for each gas flow rate. This difference in number of pores is greater at lower gas flow rates. This result indicates that ion bombardment etching is more predominant for helium than for oxygen. Helium plasma can create a very aggressive plasma, as mentioned by Kaplan (1990). As the gas flow rate increases, the difference between the number of pores created by the two gases decreases. This result indicates that the ion bombardment rate is controlling etching at the same rate for each plasma.

Figure 34 is a plot of the average pore diameters versus gas flow rate for each gas. At lower gas flow rates, the oxygen plasma produced pores that have a larger average diameter than those produced by the helium plasma. The difference in diameters of pores produced by each gas significantly decreases at the higher gas flow rates. At and above flow rates of 75 mL/min, both gases produce approximately the same average pores diameter. Chemical etching has a greater contribution to surface porosity at low oxygen gas flow rates due to reactions of active gas species with the plastic surface. On the other hand, for samples etched with helium, ion bombardment seems to have a greater contribution compared to oxygen etching, even at low gas flow rates. The effect of ion bombardment is shown by the production of a greater number of pores with smaller average diameters, compared to those produced by oxygen etching. Increasing the gas flow rate reduces the effect of chemical etching and increases the ion bombardment effect for both gases (Hartney et al., 1988), resulting in pores with similar average diameters.

The average fractional plane surface area versus gas flow rate is plotted in Figure 35 for both gases. Generally, helium gas produced a greater etched plane surface area. This effect is less at lower gas flow rates of 25 to 50 mL/min. This difference between plane surface area produced by each gas increases at higher gas flow rates. Helium shows a smaller variance in surface area with change of flow rate, while the oxygen etched area decreases to a larger extent at higher flow rates.

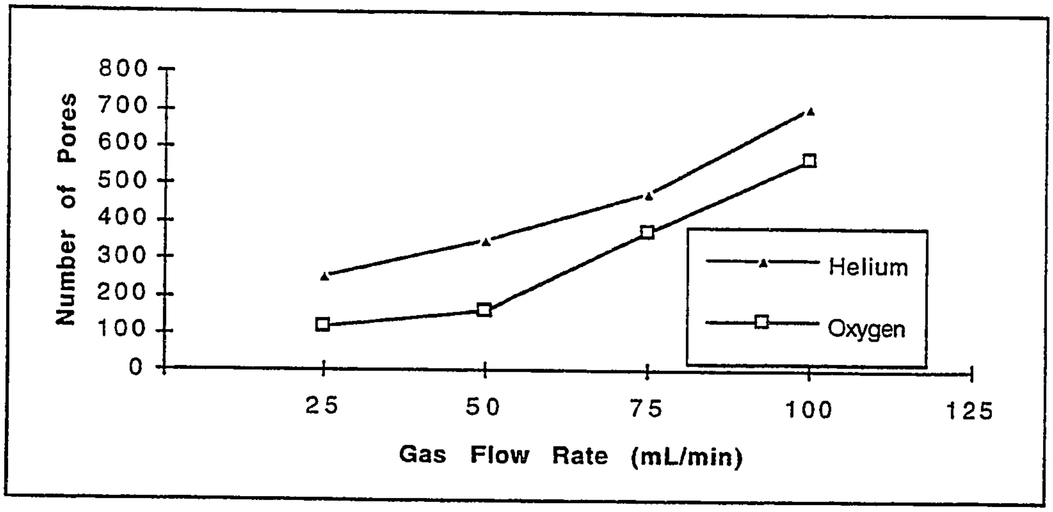


Figure 33. Average number of pores versus gas flow rate for both oxygen and helium.

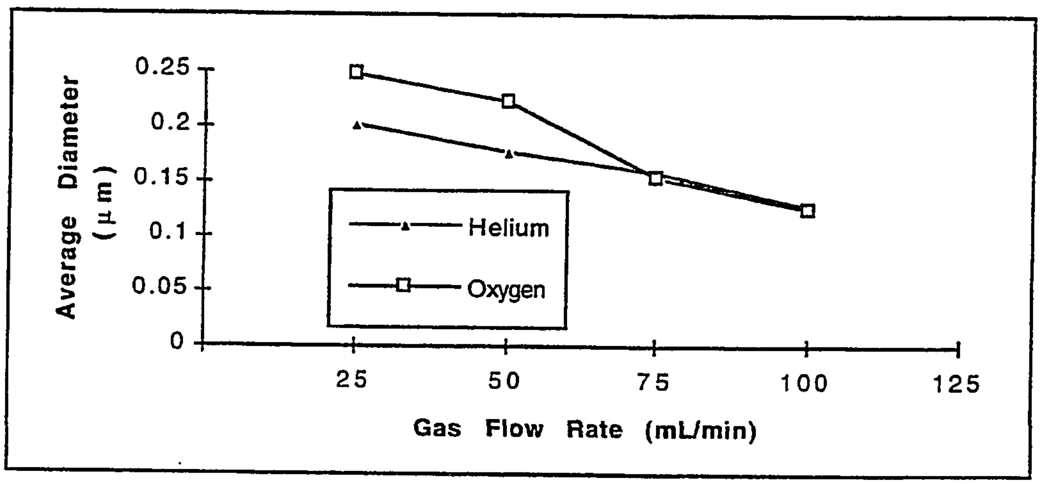


Figure 34. Average pore diameter versus gas flow rate for both oxygen and helium.

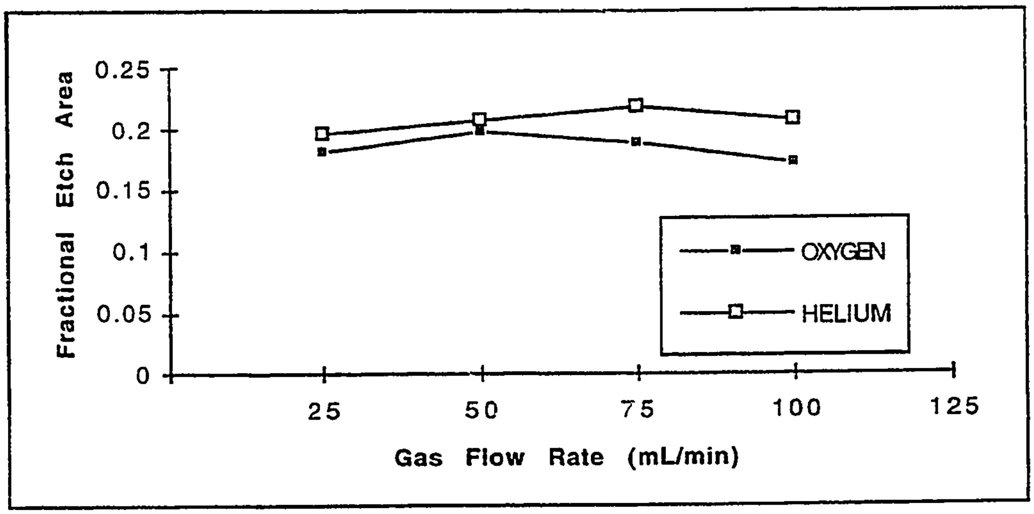


Figure 35. Average fractional plane surface area of pore versus gas flow rate for both oxygen and helium.

The average pore diameter distribution for each gas at each flow rate is plotted in Figures 36 through 39. Although helium etching resulted in a greater number of pores per most diameter ranges compared to oxygen etching, the distribution characteristics look the same for both gases. At all gas flow rates, both gases have the largest number of pores at the same average diameter range span, their second largest diameter in the same average diameter range span, and so on.

The polymer surface porosity for samples etched with either oxygen or helium seems to be a result of the combination of both chemical etching and ion bombardment etching. The extent of importance of each one of these factors is different for oxygen and helium plasmas. Oxygen plasma creates a very large number of species that react with the surface as discussed by Kaplan (1988). Those species control the etching at lower gas flow rates but are removed by the higher gas flow rate, thus resulting in ion bombardment controlling the surface etching. The kind of reactions created by helium are totally different and ion bombardment seems to have control at both low and high gas flow rate. The effectiveness of chemical etching for each gas is different since the reactions which can occur are significantly different.

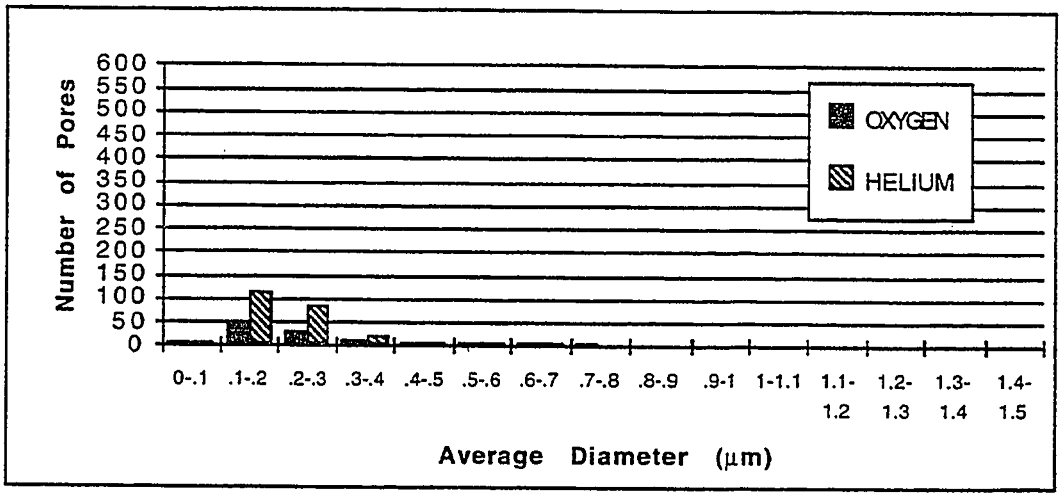


Figure 36. Average pore diameter distribution for samples etched with either oxygen or helium at 25 mL/min. flow rate.

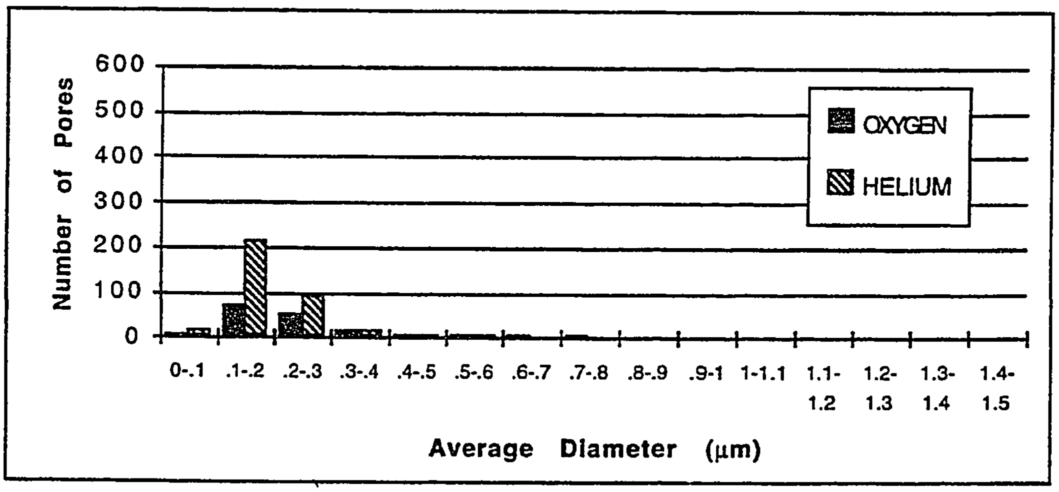


Figure 37. Average pore diameter distribution for samples etched with either oxygen or helium at 50 mL/min. flow rate.

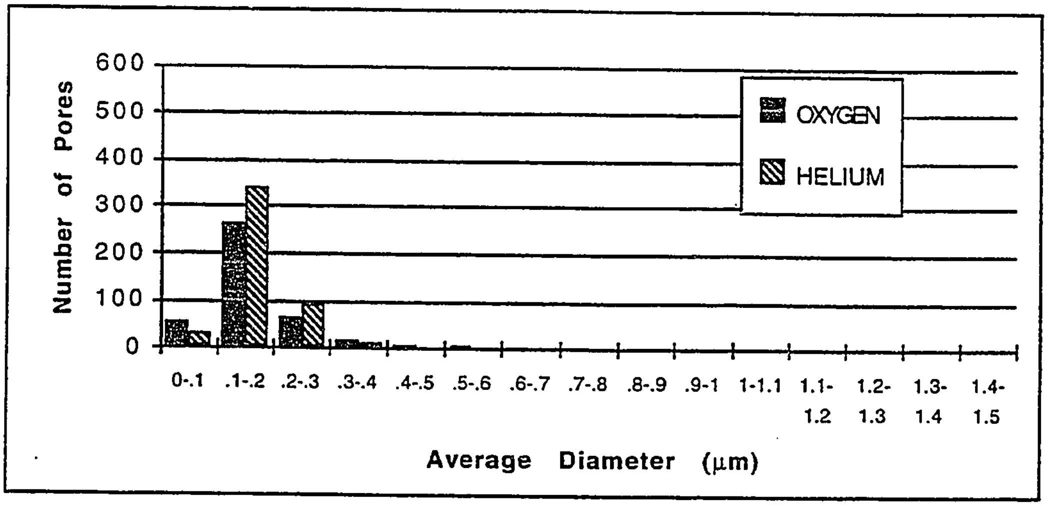


Figure 38. Average pore diameter distribution for samples etched with either oxygen or helium at 75 mL/min. flow rate.

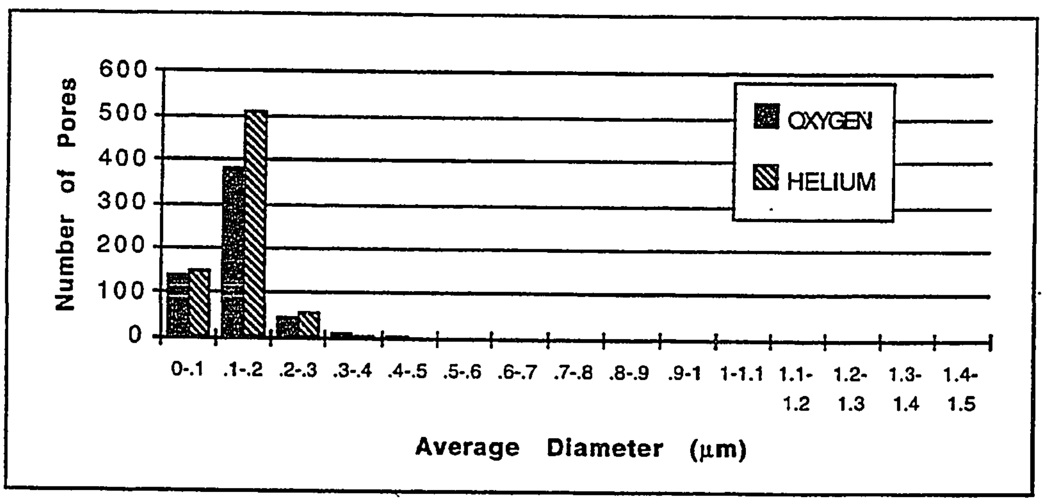


Figure 39. Average pore diameter distribution for samples etched with either oxygen or helium at 100 mL/min. flow rate.

5.8 Repeatability and Reproducibility

Both oxygen and helium plasma etching experiments were tested for repeatability and reproducibility.

Repeatability for both gases was measured by comparison of the number of pores counted from a set of four SEM micrographs taken for each of two samples etched at the same time and under the same conditions. The sample standard deviation and the error associated with the number of pores obtained from the micrograph traces are shown in Tables 4 and 5. Errors associated with oxygen are less than 11 percent while those associated with helium are less than 14 percent. Tables 4 and 5 also the same results for the average diameter of the pores. For this parameter, oxygen etched samples showed an error level less than 8 percent while helium etched samples had an error less than 7 percent.

For both oxygen and helium plasma, reproducibility was tested by etching one sample with oxygen and another with helium at a gas flow rate of 25 mL/min while keeping other plasma etching parameters the same. These experiments were repeats of earlier experiments, and were done three weeks after the original set of experiments was finished. Four SEM micrographs were taken for each sample. The standard deviation and error associated with each experiment are shown by Tables 6 and 7. Errors for both oxygen and helium were less than 12 percent.

Table 4. Oxygen plasma etching, number and average diameter of pores repeatability error analysis.

	Number of Pores				Diameter of Pores			
Gas Flowrate mL/min	25	50	75	100	25	50	75	100
Photograph ID.	O1	O2	O3	O 4	O1	O2	O3	O4
A	135	156	343	589	0.264	0.225	0.150	0.120
B	114	154	353	593	0.258	0.232	0.166	0.122
C	103	184	363	545	0.26	0.247	0.167	0.128
D	110	153	445	560	0.264	0.230	0.140	0.129
Average	115.5	161.75	376	571.75	0.262	0.239	0.156	0.125
Standard deviation	11.927	12.891	40.459	20.017	0.003	0.008	0.011	0.004
Error	10.331	7.969	10.761	3.501	1.046	3.246	7.263	2.9

Table 5. Helium plasma etching, number and average diameter of pores repeatability error analysis.

	Number of Pores				Diameter of Pores			
Gas Flowrate mL/min	25	50	75	100	25	50	75	100
Photograph ID.	H1	H2	H3	H4	H1	H2	H3	H4
A	245	361	489	696	0.120	0.180	0.154	0.134
B	277	420	462	717	0.194	0.163	0.162	0.125
C	283	309	453	736	0.190	0.183	0.164	0.119
D	204	305	514	699	0.226	0.182	0.154	0.127
Average	252.25	348.75	479.5	712	0.202	0.177	0.158	0.126
Standard Deviation	31.38	46.693	23.922	16.016	0.014	0.008	0.005	0.005
Error	12.439	13.389	4.989	2.2493	6.977	4.469	2.968	4.105

Table 6. Oxygen plasma etching number of pores and average diameter of pores reproducibility error analysis.

Photograph No.	Date	No. of Pores	Ave. Diameter
O1	8/26/1993	135	0.264
O2	8/26/1993	114	0258
O3	8/26/1993	103	0.260
O4	8/26/1993	110	0.264
O1R	9/18/1993	126	0.256
O2R	9/18/1993	117	0.258
O3R	9/18/1993	96	0.117
O4R	9/18/1993	119	0.223
average		115	0.255
Error		10.07	4.9
Standard deviation		11.577	0.0125

Table 7. Helium plasma etching number of pores and average diameter of pores reproducibility error analysis.

Photograph No.	Date	No. of Pores	Ave. Diameter
H1	9/16/1993	245	0.120
H2	9/16/1993	277	0.194
H3	9/16/1993	283	0.190
H4	9/16/1993	204	0.226
H1R	9/28/1993	212	0.195
H2R	9/28/1993	257	0.196
H3R	9/28/1993	284	0.225
H4R	9/28/1993	270	0.207
Average		254	0.204
Standard deviation		29.326	0.0132
Error		11.545	6.485

6.0 CONCLUSION

The effect of increasing the gas flow rate on the number and average diameter of pores produced on the surface of ABS plastic during plasma etching by either oxygen or helium was studied.

Increasing the gas flow rate resulted in an increase in the number of pores and a decrease in the average pore diameter for both oxygen and helium etching over the flow rate range studied, 25 - 100 mL/min.

Samples etched using oxygen as the plasma source had less pores than samples etched using helium for all flow rates studied.

Samples etched using oxygen as the plasma source had pores with a wider diameter than those produced by helium plasma etching over the flow rates of 25 - 75 mL/min. Between 75 and 100 mL/min flow rate, the average diameters produced during etching was roughly the same.

Helium etching resulted in a greater etched plane surface area than that produced by oxygen.

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Appendix A

March Plasma Etcher Description

General Description

The Cs-1701 plasma system is a parallel plate/Reactive Ion Etcher designed to offer fast, uniform, selective, anisotropic etching. It consist of two modules: the main unit and the solid state RF generator.

Chamber

The chamber internal dimensions are 10" d x 1.5" h and will hold upto one 150 mm wafer. It is constructed of hard anodized aluminum and has a ceramic ring which concentrates the plasma on the bottom electrode to maximize power utilization, thus increasing the anisotropy and etch rate. The electrodes are water cooled to maintain the substrate at low temperature during processing. The smaller bottom electrode produces a negative DC bias which increases ion bombardment and anisotropy.

Computer/Process Controller

The CS-1701 is equipped with a Z80 based computer which control all of the processing functions. The system has 8 analog channels which control the 6 gas channels (the system comes with 2 MFCs standard), the pressure, and the RF power. These processing parameters are programmed by the front panel (see Figure 1. Appendix A) where up to nine process recipes can be stored. The system controller also has a manual override which is interrupt driven and can be used to override the process end-point and program the process in progress.

Safety and Diagnostic

The instrument is programmed with various safety features, which monitor the process and shut it down in the event of a failure.

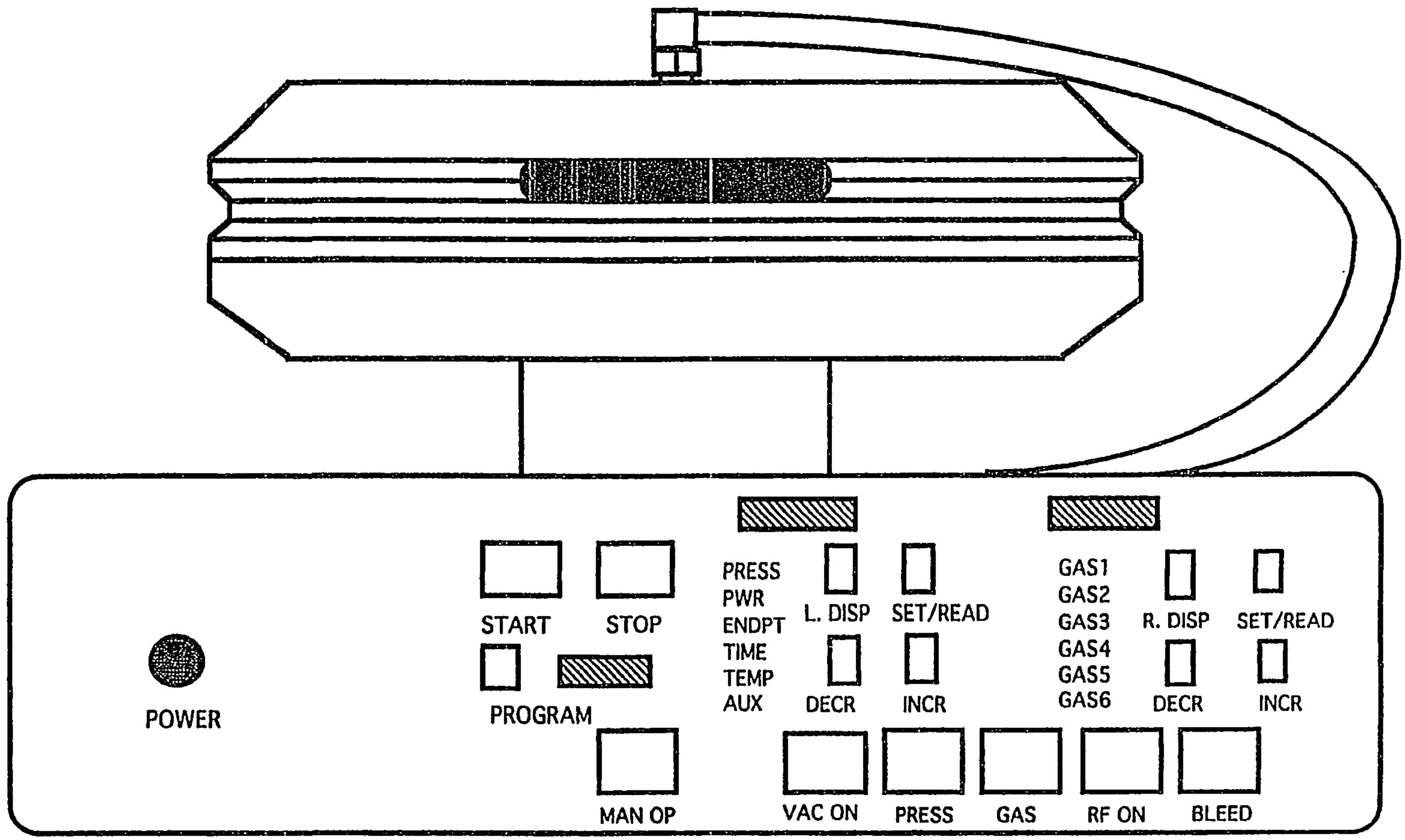

Figure A1. March Plasma Etcher.

The parameters monitored are: pressure, reflected power, gas flow and time. The stop button in the front panel interrupt the system, shuts down the process and reset the machine.

System Specification

Dimension:	20" (50 cm)x 18" (45 cm)x 14" (35 cm) (WxDxH)
Weight:	50 lbs
RF Generator:	600 watts max, 13.56 MHz, solid state Digitally controlled forward and reflected power.
Process Controls:	Two Mass Flow Controllers Baratron Pressure Guage Computer Controlled with Manual Override Automatic Pressure Control
Pump	11 CFM (310 lpm), fluorinated synthetic oil with an optional recirculation system.

APPENDIX B

Traces of SEM micrographs for samples etched with either oxygen or helium plasma at different gas flow rates.

APPENDIX B

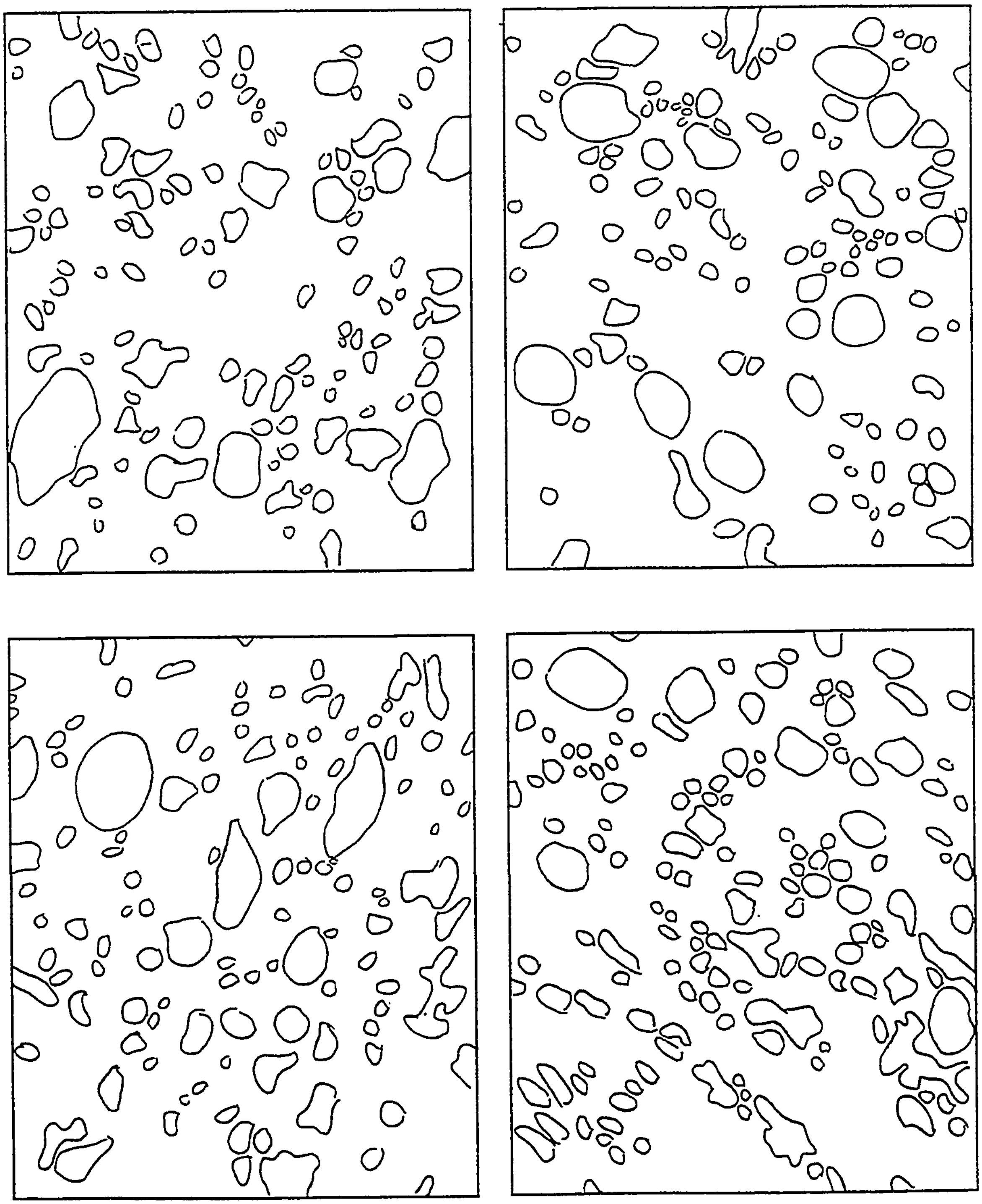

Figure B1. Samples etched with oxygen at 25 mL/min flow rate .

APPENDIX B

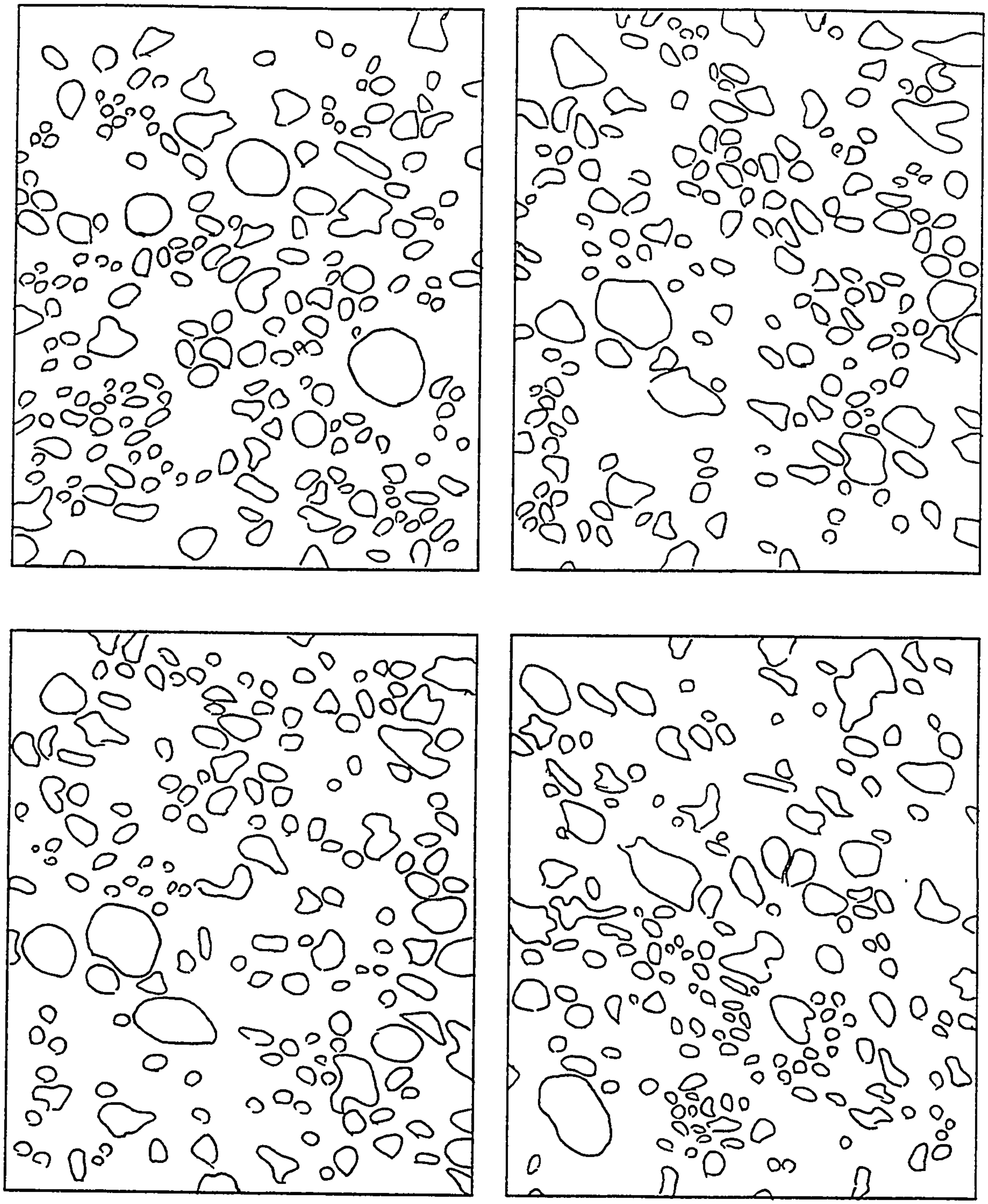

Figure B1. Samples etched with oxygen at 50 mL/min flow rate.

APPENDIX B

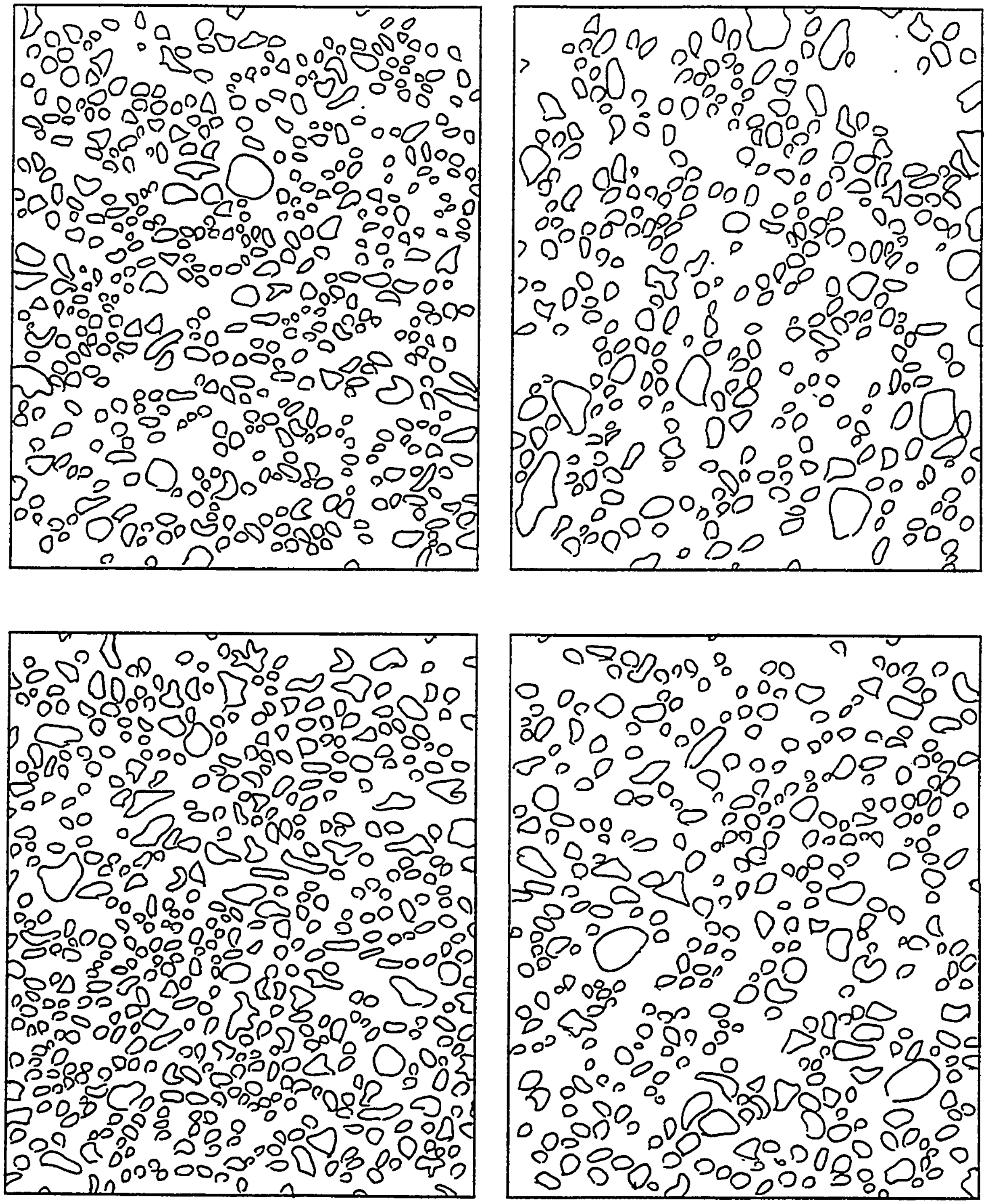

Figure B1. Samples etched with oxygen at 75 mL/min flow rate.

APPENDIX B

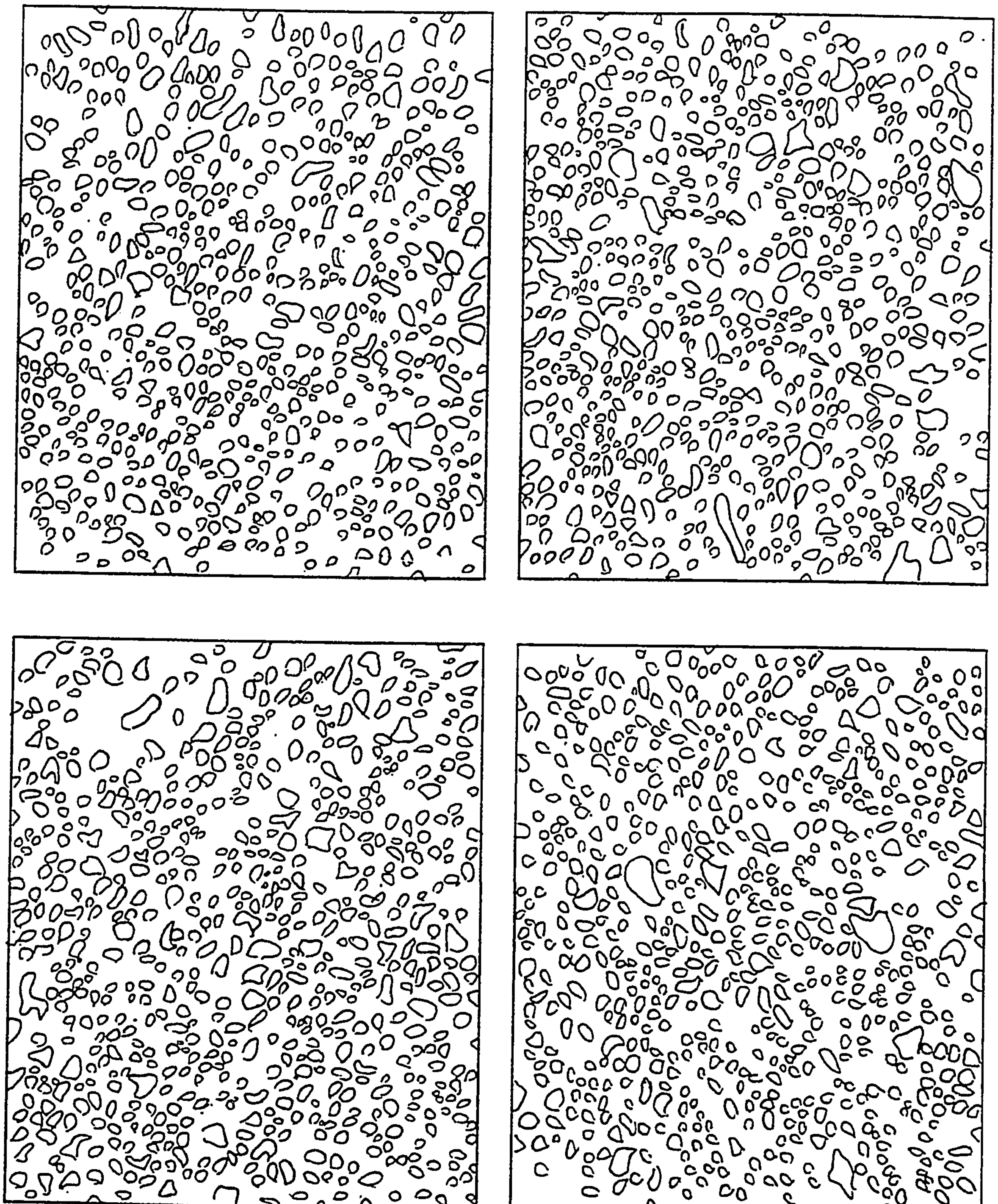

Figure B1. Samples etched with oxygen at100 mL/min flow rate.

APPENDIX B

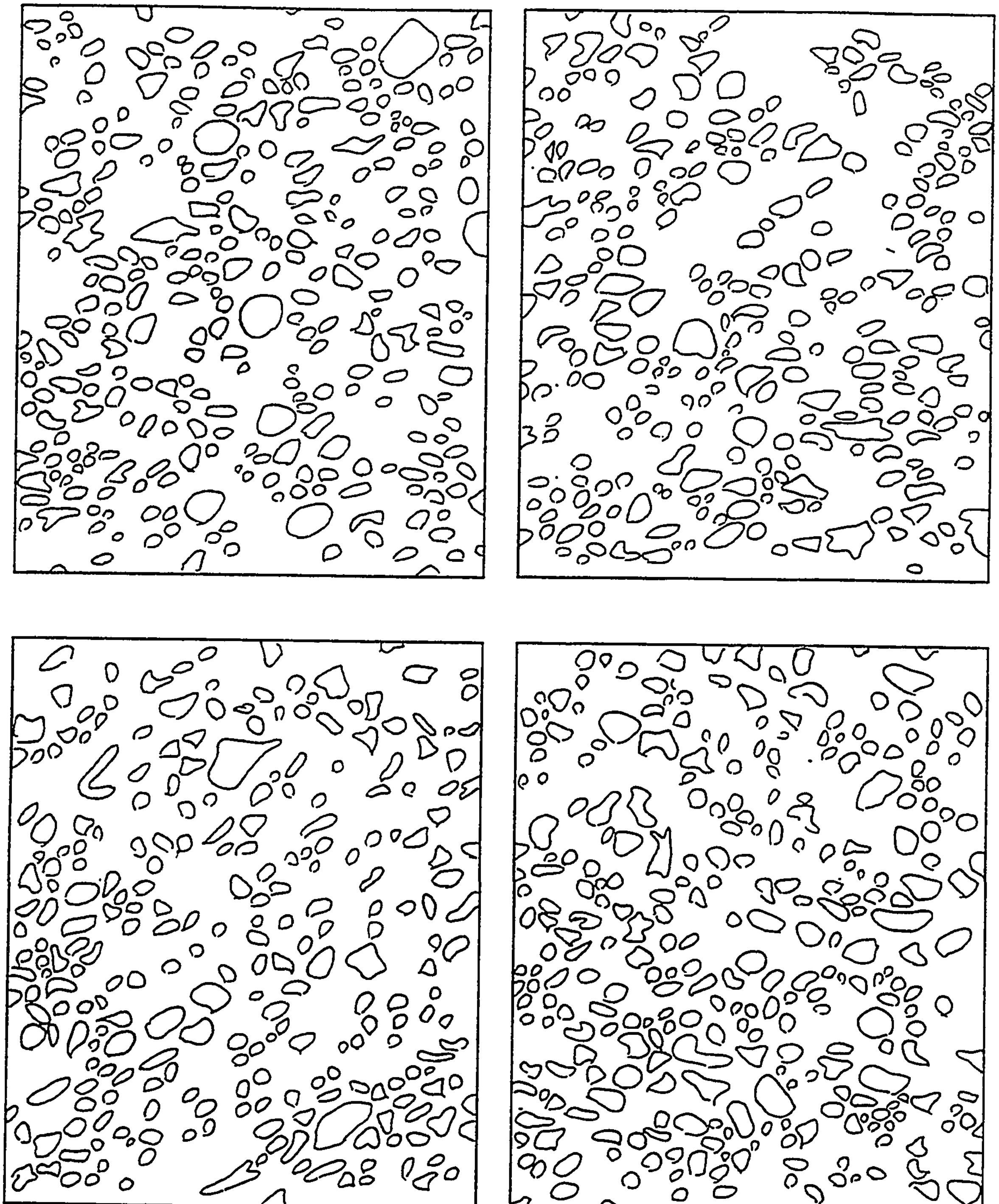

Figure B5. Samples etched with helium at a flow rate of 25 mL/min.

APPENDIX B

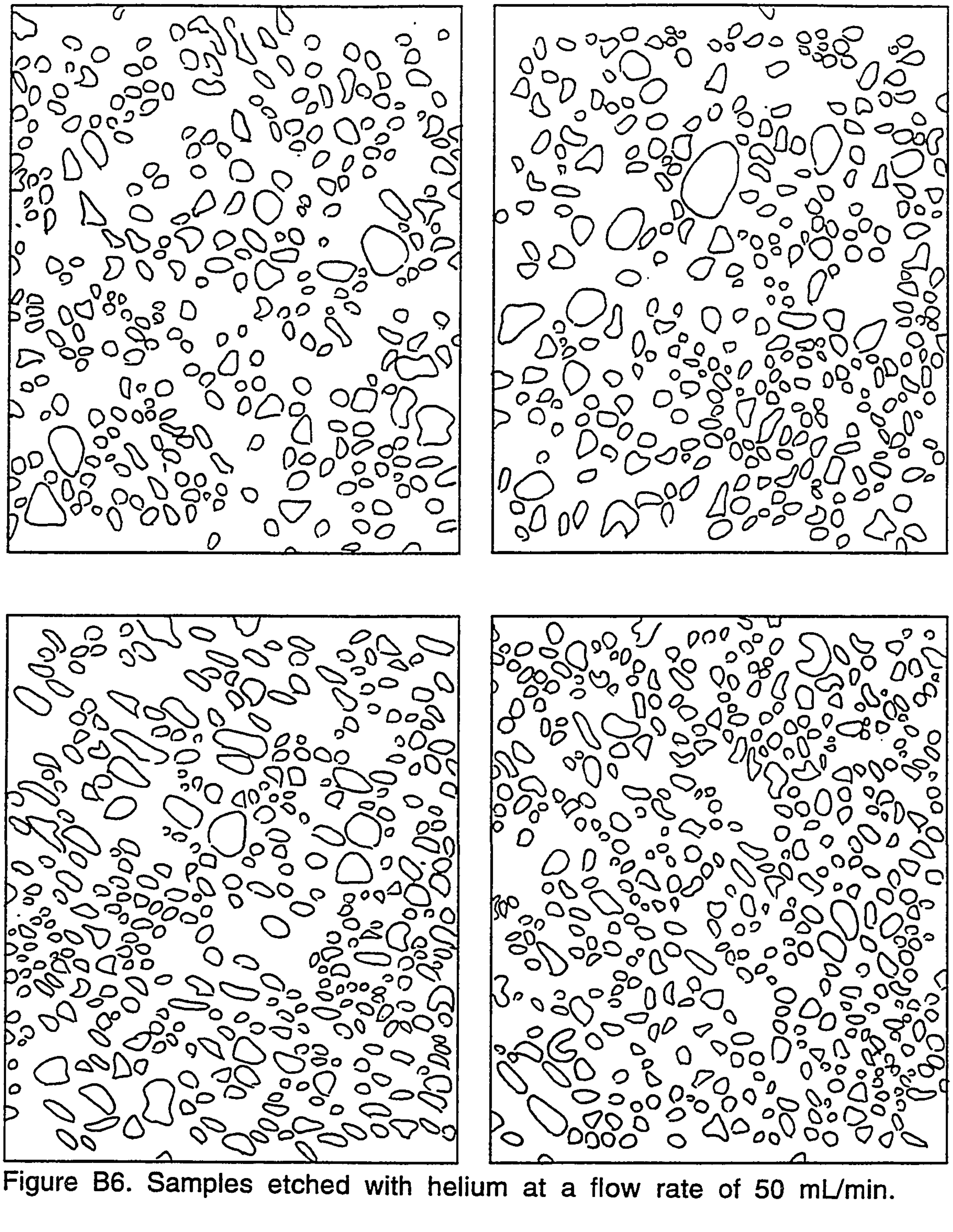

Figure B6. Samples etched with helium at a flow rate of 50 mL/min.

APPENDIX B

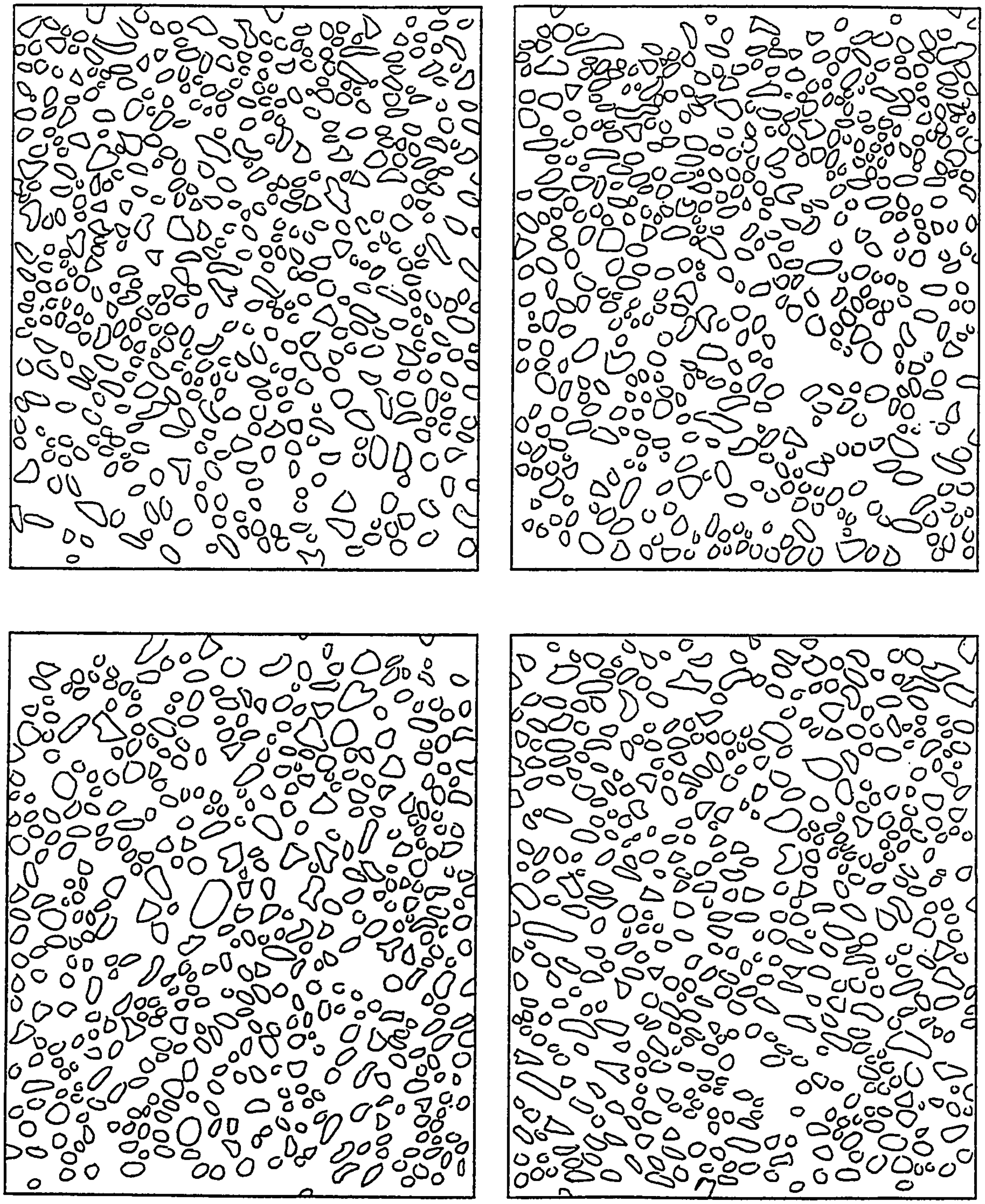

Figure B7. Samples etched with helium at a flow rate of 75 mL/min.

APPENDIX B

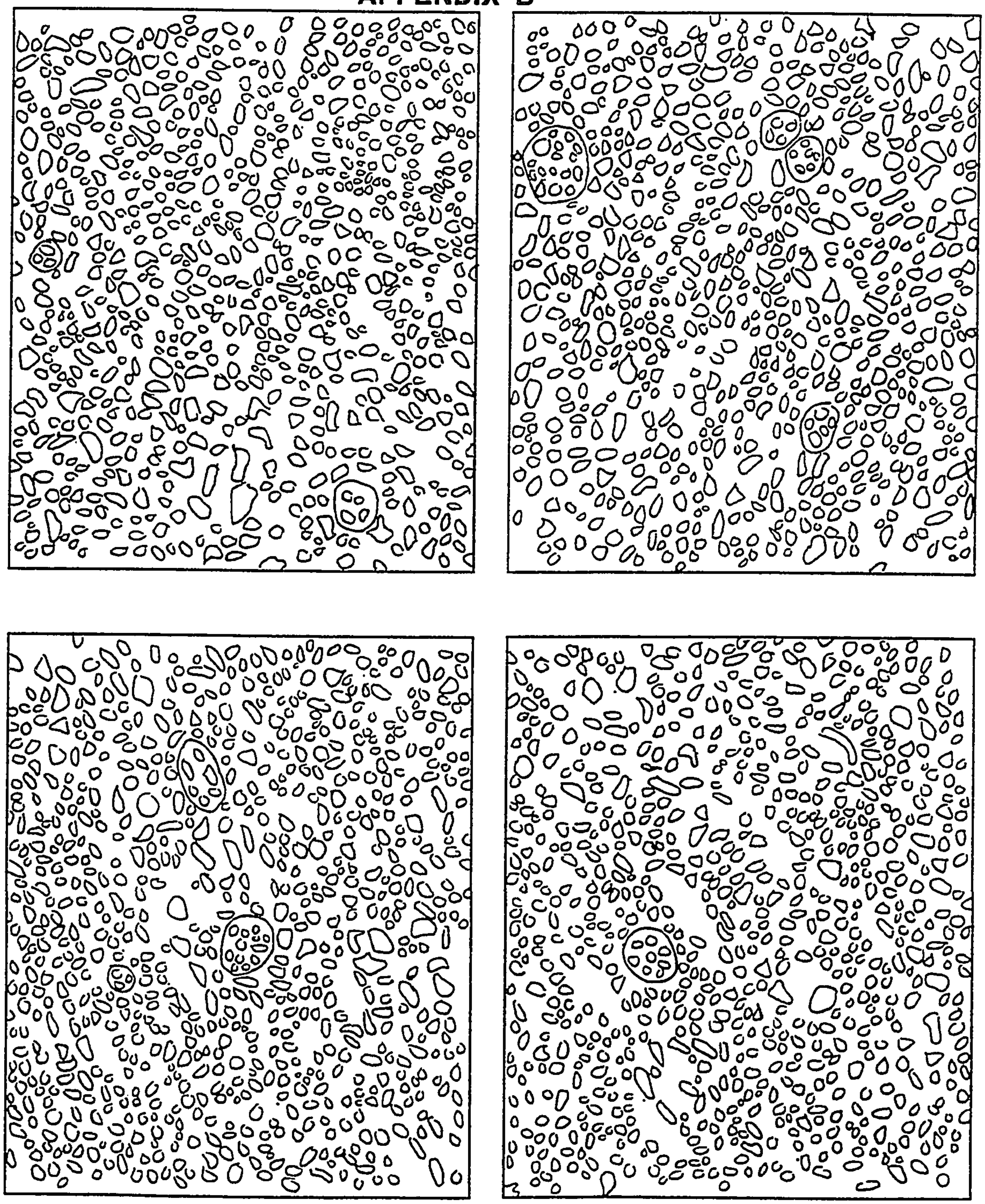

Figure B8. Samples etched with helium at a flow rate of 100 mL/min.

APPENDIX C

Tables of number, maximum diameter, mininun diameter, average diameter, and plane surface area of pores for samples etched with oxygen at flow rate 25, 50, 75 and 100 mL/min, respectively. Due to the large size of data, only one table of data is represented at each flow rate. Full data tables are available upon request.

FLOW RATE	25 mL/min.
SAMPLE ID:	O1/A
S:	2
PHOTO NO.:	7
MAGNIFICATION:	15.0 K
NO. OF PORES:	135

PORE	MAX. DIA. (mm)	MAX. DIA. (µm)	MIN. DIA. (mm)	MIN. DIA. (µm)	AVE. DIM. (µm)	AREA (µm)(µm)
1	1	0.07	1	0.07	0.07	3.49E-03
2	1	0.07	1	0.07	0.07	3.49E-03
3	2	0.13	1	0.07	0.10	7.86E-03
4	2	0.13	2	0.13	0.13	1.40E-02
5	2	0.13	2	0.13	0.13	1.40E-02
6	2	0.13	2	0.13	0.13	1.40E-02
7	2	0.13	2	0.13	0.13	1.40E-02
8	2	0.13	1.5	0.10	0.12	1.07E-02
9	2	0.13	1.5	0.10	0.12	1.07E-02
10	2.5	0.17	1.5	0.10	0.13	1.40E-02
11	2.5	0.17	2	0.13	0.15	1.77E-02
12	2.5	0.17	2	0.13	0.15	1.77E-02
13	2.5	0.17	2	0.13	0.15	1.77E-02
14	2.5	0.17	2	0.13	0.15	1.77E-02
15	2.5	0.17	3	0.20	0.18	2.64E-02
16	2.5	0.17	2	0.13	0.15	1.77E-02
17	2.5	0.17	2.5	0.17	0.17	2.18E-02
18	2.5	0.17	2.5	0.17	0.17	2.18E-02
19	3	0.20	3	0.20	0.20	3.14E-02
20	3	0.20	2	0.13	0.17	2.18E-02
21	3	0.20	2	0.13	0.17	2.18E-02
22	3	0.20	1	0.07	0.13	1.40E-02
23	3	0.20	2.5	0.17	0.18	2.64E-02
24	3	0.20	1.5	0.10	0.15	1.77E-02
25	3	0.20	3	0.20	0.20	3.14E-02
26	3	0.20	2	0.13	0.17	2.18E-02
27	3	0.20	2	0.13	0.17	2.18E-02
28	3	0.20	2.5	0.17	0.18	2.64E-02
29	3	0.20	1	0.07	0.13	1.40E-02
30	3	0.20	3	0.20	0.20	3.14E-02
31	3	0.20	2	0.13	0.17	2.18E-02
32	3	0.20	2.5	0.17	0.18	2.64E-02

PORE	MAX. DIA. (mm)	MAX. DIA. (μm)	MIN. DIA. (mm)	MIN. DIA. (μm)	AVE. DIM. (μm)	AREA (μm)(μm)
33	3	0.20	3	0.20	0.20	3.14E-02
34	3	0.20	2	0.13	0.17	2.18E-02
35	3	0.20	1	0.07	0.13	1.40E-02
36	3	0.20	2.5	0.17	0.18	2.64E-02
37	3	0.20	1.5	0.10	0.15	1.77E-02
38	3	0.20	2	0.13	0.17	2.18E-02
39	3	0.20	2	0.13	0.17	2.18E-02
40	3	0.20	3	0.20	0.20	3.14E-02
41	3	0.20	1.5	0.10	0.15	1.77E-02
42	3	0.20	3	0.20	0.20	3.14E-02
43	3	0.20	2	0.13	0.17	2.18E-02
44	3	0.20	2	0.13	0.17	2.18E-02
45	3	0.20	2	0.13	0.17	2.18E-02
46	3	0.20	2	0.13	0.17	2.18E-02
47	3	0.20	2.5	0.17	0.18	2.64E-02
48	3.5	0.23	2	0.13	0.18	2.64E-02
49	3.5	0.23	2	0.13	0.18	2.64E-02
50	3.5	0.23	2	0.13	0.18	2.64E-02
51	3.5	0.23	2	0.13	0.18	2.64E-02
52	3.5	0.23	2	0.13	0.18	2.64E-02
53	3.5	0.23	3	0.20	0.22	3.69E-02
54	3.5	0.23	3.5	0.23	0.23	4.28E-02
55	3.5	0.23	3	0.20	0.22	3.69E-02
56	3.5	0.23	2	0.13	0.18	2.64E-02
57	3.5	0.23	2	0.13	0.18	2.64E-02
58	3.5	0.23	2	0.13	0.18	2.64E-02
59	3.5	0.23	3	0.20	0.22	3.69E-02
60	3.5	0.23	3	0.20	0.22	3.69E-02
61	3.5	0.23	3.5	0.23	0.23	4.28E-02
62	3.5	0.23	3.5	0.23	0.23	4.28E-02
63	3.5	0.23	2	0.13	0.18	2.64E-02
64	4	0.23	2.5	0.17	0.20	3.14E-02
65	4	0.27	2	0.13	0.20	3.14E-02
66	4	0.27	1.5	0.10	0.18	2.64E-02
67	4	0.27	3	0.20	0.23	4.28E-02
68	4	0.27	2	0.13	0.20	3.14E-02
69	4	0.27	2	0.13	0.20	3.14E-02
70	4	0.27	3	0.20	0.23	4.28E-02
71	4	0.27	3	0.20	0.23	4.28E-02
72	4	0.27	1.5	0.10	0.18	2.64E-02
73	4	0.27	2	0.13	0.20	3.14E-02

PORE	MAX. DIA. (mm)	MAX. DIA. (μm)	MIN. DIA. (mm)	MIN. DIA. (μm)	AVE. DIM. (μm)	AREA (μm)(μm)
74	4	0.27	2	0.13	0.20	3.14E-02
75	4	0.27	1.5	0.10	0.18	2.64E-02
76	4	0.27	3	0.20	0.23	4.28E-02
77	4.5	0.27	2	0.13	0.20	3.14E-02
78	4.5	0.30	3.5	0.23	0.27	5.59E-02
79	4.5	0.30	3.5	0.23	0.27	5.59E-02
80	4.5	0.30	1.5	0.10	0.20	3.14E-02
81	4.5	0.30	2	0.13	0.22	3.69E-02
82	4.5	0.30	3	0.20	0.25	4.91E-02
83	4.5	0.30	4	0.27	0.28	6.31E-02
84	4.5	0.30	3.5	0.23	0.27	5.59E-02
85	5	0.30	3	0.20	0.25	4.91E-02
86	5	0.33	2	0.13	0.23	4.28E-02
87	5	0.33	3	0.20	0.27	5.59E-02
88	5	0.33	3.5	0.23	0.28	6.31E-02
89	5	0.33	2.5	0.17	0.25	4.91E-02
90	5	0.33	4	0.27	0.30	7.07E-02
91	5	0.33	4	0.27	0.30	7.07E-02
92	5	0.33	1.5	0.10	0.22	3.69E-02
93	5.5	0.33	3.5	0.23	0.28	6.31E-02
94	6	0.37	3.5	0.23	0.30	7.07E-02
95	6	0.40	3.5	0.23	0.32	7.88E-02
96	6	0.40	3.5	0.23	0.32	7.88E-02
97	6	0.40	4	0.27	0.33	8.73E-02
98	6	0.40	4	0.27	0.33	8.73E-02
99	6	0.40	4	0.27	0.33	8.73E-02
100	6	0.40	5	0.33	0.37	1.06E-01
101	6	0.40	4	0.27	0.33	8.73E-02
102	6.5	0.40	4.5	0.30	0.35	9.62E-02
103	6.5	0.43	2	0.13	0.28	6.31E-02
104	7	0.43	5	0.33	0.38	1.15E-01
105	7	0.47	3	0.20	0.33	8.73E-02
106	7	0.47	4	0.27	0.37	1.06E-01
107	7	0.47	1.5	0.10	0.28	6.31E-02
108	7	0.47	4	0.27	0.37	1.06E-01
109	7	0.47	4.5	0.30	0.38	1.15E-01
110	7	0.47	5	0.33	0.40	1.26E-01
111	7	0.47	2	0.13	0.30	7.07E-02
112	7	0.47	5	0.33	0.40	1.26E-01
113	8	0.47	4	0.27	0.37	1.06E-01
114	8	0.53	1	0.07	0.30	7.07E-02

PORE	MAX. DIA. (mm)	MAX. DIA. (μm)	MIN. DIA. (mm)	MIN. DIA. (μm)	AVE. DIM. (μm)	AREA (μm)(μm)
115	8	0.53	4.5	0.30	0.42	1.36E-01
116	8	0.53	3	0.20	0.37	1.06E-01
117	8.5	0.53	4	0.27	0.40	1.26E-01
118	9	0.57	3.5	0.23	0.40	1.26E-01
119	9	0.60	5	0.33	0.47	1.71E-01
120	9.5	0.60	9	0.60	0.60	2.83E-01
121	9.5	0.63	5.5	0.37	0.50	1.96E-01
122	10	0.63	4	0.27	0.45	1.59E-01
123	10	0.67	7	0.47	0.57	2.52E-01
124	10	0.67	3	0.20	0.43	1.48E-01
125	10.5	0.67	2	0.13	0.40	1.26E-01
126	11	0.70	7	0.47	0.58	2.67E-01
127	11	0.73	3	0.20	0.47	1.71E-01
128	11	0.73	2	0.13	0.43	1.48E-01
129	11.5	0.73	3	0.20	0.47	1.71E-01
130	12	0.77	5	0.33	0.55	2.38E-01
131	14.5	0.80	7	0.47	0.63	3.15E-01
132	15	0.97	6	0.40	0.68	3.67E-01
133	16	1.00	2.5	0.17	0.58	2.67E-01
134	16	1.07	10	0.67	0.87	5.90E-01
135	23	1.07	4	0.27	0.67	3.49E-01
Ave.	5.17037	0.34	2.903704	0.19	0.26	9.42E+00
STD. DEV.		0.20		0.10	0.14	8.42E-02

FLOW RATE:	50 ml/min
SAMPLE ID:	O2/d
S:	1
PHOTO NO.:	33
MAGNIFICATION:	15.0 K
NO. OF PORES:	153

PORE	MAX. DIA. (mm)	MAX. DIA. (μm)	MIN. DIA. (mm)	MIN. DIA. (μm)	AVE. DIA. (μm)	AREA (μm)(μm)
1	12.5	0.83	6.5	0.43	0.63	3.15E-01
2	6	0.40	2	0.13	0.27	5.59E-02
3	5	0.33	2	0.13	0.23	4.28E-02
4	2.5	0.17	2.5	0.17	0.17	2.18E-02
5	2	0.13	2	0.13	0.13	1.40E-02
6	2.5	0.17	2	0.13	0.15	1.77E-02
7	2.5	0.17	2	0.13	0.15	1.77E-02
8	8	0.53	5	0.33	0.43	1.48E-01
9	6	0.40	2.5	0.17	0.28	6.31E-02
10	3	0.20	3	0.20	0.20	3.14E-02
11	2	0.13	2	0.13	0.13	1.40E-02
12	15	1.00	6	0.40	0.70	3.85E-01
13	5	0.33	4	0.27	0.30	7.07E-02
14	5	0.33	3	0.20	0.27	5.59E-02
15	4	0.27	3	0.20	0.23	4.28E-02
16	3	0.20	2.5	0.17	0.18	2.64E-02
17	2.5	0.17	1.5	0.10	0.13	1.40E-02
18	1.5	0.10	1	0.07	0.08	5.46E-03
19	4	0.27	2	0.13	0.20	3.14E-02
20	3	0.20	1	0.07	0.13	1.40E-02
21	2.5	0.17	1	0.07	0.12	1.07E-02
22	6.5	0.43	2.5	0.17	0.30	7.07E-02
23	4	0.27	2	0.13	0.20	3.14E-02
24	4.5	0.30	1.5	0.10	0.20	3.14E-02
25	5	0.33	3	0.20	0.27	5.59E-02
26	7	0.47	4	0.27	0.37	1.06E-01
27	4	0.27	3.5	0.23	0.25	4.91E-02
28	4	0.27	2.5	0.17	0.22	3.69E-02
29	5	0.33	5	0.33	0.33	8.73E-02
30	9.5	0.63	7	0.47	0.55	2.38E-01
31	7	0.47	2	0.13	0.30	7.07E-02
32	3	0.20	2	0.13	0.17	2.18E-02

PORE	MAX. DIA. (mm)	MAX. DIA. (μm)	MIN. DIA. (mm)	MIN. DIA. (μm)	AVE. DIA. (μm)	AREA (μm)(μm)
33	3	0.20	2	0.13	0.17	2.18E-02
34	4	0.27	1.5	0.10	0.18	2.64E-02
35	3	0.20	2	0.13	0.17	2.18E-02
36	3	0.20	3	0.20	0.20	3.14E-02
37	4	0.27	2	0.13	0.20	3.14E-02
38	4	0.27	2	0.13	0.20	3.14E-02
39	2.5	0.17	2	0.13	0.15	1.77E-02
40	2.5	0.17	1.5	0.10	0.13	1.40E-02
41	9	0.60	5	0.33	0.47	1.71E-01
42	7	0.47	3	0.20	0.33	8.73E-02
43	5.5	0.37	3	0.20	0.28	6.31E-02
44	3.5	0.23	3	0.20	0.22	3.69E-02
45	3	0.20	2.5	0.17	0.18	2.64E-02
46	2	0.13	2	0.13	0.13	1.40E-02
47	2.5	0.17	2	0.13	0.15	1.77E-02
48	2.5	0.17	2.5	0.17	0.17	2.18E-02
49	12	0.80	6.5	0.43	0.62	2.99E-01
50	7	0.47	2.5	0.17	0.32	7.88E-02
51	8	0.53	3	0.20	0.37	1.06E-01
52	3	0.20	2	0.13	0.17	2.18E-02
53	5	0.33	3	0.20	0.27	5.59E-02
54	6.5	0.43	3	0.20	0.32	7.88E-02
55	2.5	0.17	1.5	0.10	0.13	1.40E-02
56	1	0.07	1	0.07	0.07	3.49E-03
57	3.5	0.23	2	0.13	0.18	2.64E-02
58	4.5	0.30	2.5	0.17	0.23	4.28E-02
59	4	0.27	3.5	0.23	0.25	4.91E-02
60	1.5	0.10	1	0.07	0.08	5.46E-03
61	4.5	0.30	1.5	0.10	0.20	3.14E-02
62	8	0.53	2.5	0.17	0.35	9.62E-02
63	5	0.33	2	0.13	0.23	4.28E-02
64	5	0.33	3.5	0.23	0.28	6.31E-02
65	3	0.20	2	0.13	0.17	2.18E-02
66	2	0.13	2	0.13	0.13	1.40E-02
67	16	1.07	8.5	0.57	0.82	5.24E-01
68	3	0.20	2.5	0.17	0.18	2.64E-02
69	3.5	0.23	1.5	0.10	0.17	2.18E-02
70	5	0.33	3	0.20	0.27	5.59E-02
71	5	0.33	2.5	0.17	0.25	4.91E-02
72	4	0.27	1.5	0.10	0.18	2.64E-02
73	5.5	0.37	2	0.13	0.25	4.91E-02

PORE	MAX. DIA. (mm)	MAX. DIA. (μm)	MIN. DIA. (mm)	MIN. DIA. (μm)	AVE. DIA. (μm)	AREA (μm)(μm)
74	5	0.33	3	0.20	0.27	5.59E-02
75	7.5	0.50	3	0.20	0.35	9.62E-02
76	6	0.40	3.5	0.23	0.32	7.88E-02
77	6	0.40	2.5	0.17	0.28	6.31E-02
78	3	0.20	2.5	0.17	0.18	2.64E-02
79	7.5	0.50	4	0.27	0.38	1.15E-01
80	7.5	0.50	4	0.27	0.38	1.15E-01
81	4.5	0.30	3.5	0.23	0.27	5.59E-02
82	5	0.33	3	0.20	0.27	5.59E-02
83	5	0.33	2.5	0.17	0.25	4.91E-02
84	4	0.27	3	0.20	0.23	4.28E-02
85	3	0.20	3	0.20	0.20	3.14E-02
86	3.5	0.23	2	0.13	0.18	2.64E-02
87	5.5	0.37	3.5	0.23	0.30	7.07E-02
88	3	0.20	3	0.20	0.20	3.14E-02
89	4	0.27	3	0.20	0.23	4.28E-02
90	3	0.20	2.5	0.17	0.18	2.64E-02
91	8.5	0.57	2.5	0.17	0.37	1.06E-01
92	6.5	0.43	2.5	0.17	0.30	7.07E-02
93	4	0.27	2	0.13	0.20	3.14E-02
94	7	0.47	3.5	0.23	0.35	9.62E-02
95	5	0.33	3	0.20	0.27	5.59E-02
96	3	0.20	2	0.13	0.17	2.18E-02
97	4	0.27	2	0.13	0.20	3.14E-02
98	4.5	0.30	2	0.13	0.22	3.69E-02
99	4	0.27	2	0.13	0.20	3.14E-02
100	4	0.27	3	0.20	0.23	4.28E-02
101	8.5	0.57	3	0.20	0.38	1.15E-01
102	7	0.47	3	0.20	0.33	8.73E-02
103	7.5	0.50	3	0.20	0.35	9.62E-02
104	5	0.33	1	0.07	0.20	3.14E-02
105	3	0.20	2	0.13	0.17	2.18E-02
106	2	0.13	1	0.07	0.10	7.86E-03
107	5	0.33	4	0.27	0.30	7.07E-02
108	4	0.27	1.5	0.10	0.18	2.64E-02
109	5.5	0.37	3	0.20	0.28	6.31E-02
110	6	0.40	4	0.27	0.33	8.73E-02
111	6	0.40	2	0.13	0.27	5.59E-02
112	2	0.13	1	0.07	0.10	7.86E-03
113	2.5	0.17	2	0.13	0.15	1.77E-02
114	5.5	0.37	2.5	0.17	0.27	5.59E-02

PORE	MAX. DIA. (mm)	MAX. DIA. (μm)	MIN. DIA. (mm)	MIN. DIA. (μm)	AVE. DIA. (μm)	AREA (μm)(μm)
115	3	0.20	2	0.13	0.17	2.18E-02
116	3	0.20	2.5	0.17	0.18	2.64E-02
117	3	0.20	1.5	0.10	0.15	1.77E-02
118	2	0.13	1	0.07	0.10	7.86E-03
119	3.5	0.23	2	0.13	0.18	2.64E-02
120	2.5	0.17	2	0.13	0.15	1.77E-02
121	5.5	0.37	2.5	0.17	0.27	5.59E-02
122	2.5	0.17	2	0.13	0.15	1.77E-02
123	2.5	0.17	2	0.13	0.15	1.77E-02
124	4	0.27	2.5	0.17	0.22	3.69E-02
125	3.5	0.23	2	0.13	0.18	2.64E-02
126	16.5	1.10	11.5	0.77	0.93	6.84E-01
127	10	0.67	6	0.40	0.53	2.23E-01
128	7	0.47	5	0.33	0.40	1.26E-01
129	3	0.20	1.5	0.10	0.15	1.77E-02
130	3	0.20	2	0.13	0.17	2.18E-02
131	4	0.27	3	0.20	0.23	4.28E-02
132	2	0.13	1	0.07	0.10	7.86E-03
133	3	0.20	2	0.13	0.17	2.18E-02
134	3	0.20	2.5	0.17	0.18	2.64E-02
135	4.5	0.30	2.5	0.17	0.23	4.28E-02
136	3.5	0.23	1	0.07	0.15	1.77E-02
137	3	0.20	2	0.13	0.17	2.18E-02
138	6	0.40	3.5	0.23	0.32	7.88E-02
139	5	0.33	2.5	0.17	0.25	4.91E-02
140	4	0.27	2	0.13	0.20	3.14E-02
141	3.5	0.23	1.5	0.10	0.17	2.18E-02
142	3.5	0.23	3	0.20	0.22	3.69E-02
143	3	0.20	2	0.13	0.17	2.18E-02
144	5	0.33	3	0.20	0.27	5.59E-02
145	4	0.27	2.5	0.17	0.22	3.69E-02
146	4	0.27	2	0.13	0.20	3.14E-02
147	3.5	0.23	1.5	0.10	0.17	2.18E-02
148	5	0.33	2.5	0.17	0.25	4.91E-02
149	4	0.27	3	0.20	0.23	4.28E-02
150	5	0.33	3	0.20	0.27	5.59E-02
151	5	0.33	2	0.13	0.23	4.28E-02
152	3.5	0.23	3	0.20	0.22	3.69E-02
153	4	0.27	2	0.13	0.20	3.14E-02
154	3	0.20	1.5	0.10	0.15	1.77E-02
155	5	0.33	2	0.13	0.23	4.28E-02

PORE	MAX. DIA. (mm)	MAX. DIA. (μm)	MIN. DIA. (mm)	MIN. DIA. (μm)	AVE. DIA. (μm)	AREA (μm)(μm)
AVE.	4.659091	0.31	2.652597	0.18	0.24	9.08E+00
STD. DEV.		0.17		0.09		

FLOW RATE:		75
SAMPLE ID:	O3/d	
S:		1
PHOTO NO.:		44
MAGNIFICATION	15.0 K	
NO. OF PORES:		445

PORE	MAX. DIA. (mm)	MAX. DIA. (µm)	MIN. DIA. (mm)	MIN. DIA. (µm)	AVE. DIA. (µm)	AREA (µm)(µm)
1	6	0.40	2	0.13	0.27	5.59E-02
2	3	0.20	1.5	0.10	0.15	1.77E-02
3	6	0.40	1	0.07	0.23	4.28E-02
4	5.5	0.37	4	0.27	0.32	7.88E-02
5	4	0.27	2	0.13	0.20	3.14E-02
6	8	0.53	5	0.33	0.43	1.48E-01
7	3	0.20	1.5	0.10	0.15	1.77E-02
8	6	0.40	1.5	0.10	0.25	4.91E-02
9	3.5	0.23	1	0.07	0.15	1.77E-02
10	2	0.13	1	0.07	0.10	7.86E-03
11	1.5	0.10	1	0.07	0.08	5.46E-03
12	5	0.33	1	0.07	0.20	3.14E-02
13	2	0.13	1	0.07	0.10	7.86E-03
14	2	0.13	1	0.07	0.10	7.86E-03
15	8	0.53	3.5	0.23	0.38	1.15E-01
16	2	0.13	1	0.07	0.10	7.86E-03
17	2	0.13	1	0.07	0.10	7.86E-03
18	3	0.20	2	0.13	0.17	2.18E-02
19	4	0.27	1.5	0.10	0.18	2.64E-02
20	5	0.33	2	0.13	0.23	4.28E-02
21	2	0.13	1	0.07	0.10	7.86E-03
22	2	0.13	1.5	0.10	0.12	1.07E-02
23	2.5	0.17	2	0.13	0.15	1.77E-02
24	1	0.07	1	0.07	0.07	3.49E-03
25	2	0.13	1.5	0.10	0.12	1.07E-02
26	2	0.13	1.5	0.10	0.12	1.07E-02
27	2	0.13	2	0.13	0.13	1.40E-02
28	3	0.20	1	0.07	0.13	1.40E-02
29	4	0.27	2	0.13	0.20	3.14E-02
30	5.5	0.37	3	0.20	0.28	6.31E-02
31	3	0.20	2	0.13	0.17	2.18E-02
32	2	0.13	1	0.07	0.10	7.86E-03

PORE	MAX. DIA. (mm)	MAX. DIA. (μm)	MIN. DIA. (mm)	MIN. DIA. (μm)	AVE. DIA. (μm)	AREA (μm)(μm)
33	2	0.13	1	0.07	0.10	7.86E-03
34	1.5	0.10	1	0.07	0.08	5.46E-03
35	3	0.20	2.5	0.17	0.18	2.64E-02
36	3.5	0.23	1.5	0.10	0.17	2.18E-02
37	2	0.13	2	0.13	0.13	1.40E-02
38	5	0.33	1.5	0.10	0.22	3.69E-02
39	2	0.13	1	0.07	0.10	7.86E-03
40	4	0.27	1.5	0.10	0.18	2.64E-02
41	3	0.20	1	0.07	0.13	1.40E-02
42	3	0.20	2	0.13	0.17	2.18E-02
43	2.5	0.17	2	0.13	0.15	1.77E-02
44	1	0.07	1	0.07	0.07	3.49E-03
45	2	0.13	1	0.07	0.10	7.86E-03
46	3	0.20	1.5	0.10	0.15	1.77E-02
47	5.5	0.37	1.5	0.10	0.23	4.28E-02
48	5	0.33	3	0.20	0.27	5.59E-02
49	3	0.20	2	0.13	0.17	2.18E-02
50	2	0.13	1	0.07	0.10	7.86E-03
51	4	0.27	1	0.07	0.17	2.18E-02
52	2	0.13	2	0.13	0.13	1.40E-02
53	9	0.60	3	0.20	0.40	1.26E-01
54	3	0.20	2	0.13	0.17	2.18E-02
55	3	0.20	2	0.13	0.17	2.18E-02
56	3	0.20	2	0.13	0.17	2.18E-02
57	2.5	0.17	2	0.13	0.15	1.77E-02
58	1	0.07	0.5	0.03	0.05	1.96E-03
59	2.5	0.17	1	0.07	0.12	1.07E-02
60	2	0.13	1	0.07	0.10	7.86E-03
61	6	0.40	5	0.33	0.37	1.06E-01
62	5	0.33	3	0.20	0.27	5.59E-02
63	3.5	0.23	2	0.13	0.18	2.64E-02
64	3	0.20	2	0.13	0.17	2.18E-02
65	3	0.20	1	0.07	0.13	1.40E-02
66	1	0.07	1	0.07	0.07	3.49E-03
67	2.5	0.17	2	0.13	0.15	1.77E-02
68	3.5	0.23	1	0.07	0.15	1.77E-02
69	4	0.27	3	0.20	0.23	4.28E-02
70	3	0.20	2	0.13	0.17	2.18E-02
71	2.5	0.17	2	0.13	0.15	1.77E-02
72	2	0.13	2	0.13	0.13	1.40E-02
73	1.5	0.10	0.5	0.03	0.07	3.49E-03

PORE	MAX. DIA. (mm)	MAX. DIA. (μm)	MIN. DIA. (mm)	MIN. DIA. (μm)	AVE. DIA. (μm)	AREA (μm)(μm)
74	2	0.13	1	0.07	0.10	7.86E-03
75	2.5	0.17	1.5	0.10	0.13	1.40E-02
76	2.5	0.17	2	0.13	0.15	1.77E-02
77	3	0.20	1	0.07	0.13	1.40E-02
78	2.5	0.17	1	0.07	0.12	1.07E-02
79	3	0.20	2	0.13	0.17	2.18E-02
80	3.5	0.23	2	0.13	0.18	2.64E-02
81	1.5	0.10	1.5	0.10	0.10	7.86E-03
82	2	0.13	1.5	0.10	0.12	1.07E-02
83	2	0.13	1.5	0.10	0.12	1.07E-02
84	4.5	0.30	1.5	0.10	0.20	3.14E-02
85	5	0.33	2	0.13	0.23	4.28E-02
86	4	0.27	1.5	0.10	0.18	2.64E-02
87	4	0.27	1	0.07	0.17	2.18E-02
88	3.5	0.23	1	0.07	0.15	1.77E-02
89	3	0.20	1	0.07	0.13	1.40E-02
90	3.5	0.23	2.5	0.17	0.20	3.14E-02
91	3.5	0.23	1	0.07	0.15	1.77E-02
92	2	0.13	1	0.07	0.10	7.86E-03
93	2.5	0.17	1	0.07	0.12	1.07E-02
94	4	0.27	0.5	0.03	0.15	1.77E-02
95	4	0.27	2.5	0.17	0.22	3.69E-02
96	3	0.20	1.5	0.10	0.15	1.77E-02
97	3	0.20	1	0.07	0.13	1.40E-02
98	3	0.20	2	0.13	0.17	2.18E-02
99	3.5	0.23	2.5	0.17	0.20	3.14E-02
100	2	0.13	1	0.07	0.10	7.86E-03
101	3	0.20	1.5	0.10	0.15	1.77E-02
102	3	0.20	1.5	0.10	0.15	1.77E-02
103	4	0.27	2	0.13	0.20	3.14E-02
104	2	0.13	1	0.07	0.10	7.86E-03
105	2.5	0.17	2.5	0.17	0.17	2.18E-02
106	7	0.47	3	0.20	0.33	8.73E-02
107	2	0.13	1	0.07	0.10	7.86E-03
108	8	0.53	2	0.13	0.33	8.73E-02
109	2	0.13	1	0.07	0.10	7.86E-03
110	3	0.20	2	0.13	0.17	2.18E-02
111	3.5	0.23	1	0.07	0.15	1.77E-02
112	2	0.13	1	0.07	0.10	7.86E-03
113	2.5	0.17	1.5	0.10	0.13	1.40E-02
114	3.5	0.23	1.5	0.10	0.17	2.18E-02

PORE	MAX. DIA. (mm)	MAX. DIA. (μm)	MIN. DIA. (mm)	MIN. DIA. (μm)	AVE. DIA. (μm)	AREA (μm)(μm)
115	3.5	0.23	1.5	0.10	0.17	2.18E-02
116	1	0.07	1	0.07	0.07	3.49E-03
117	2	0.13	2	0.13	0.13	1.40E-02
118	3	0.20	2	0.13	0.17	2.18E-02
119	3.5	0.23	2	0.13	0.18	2.64E-02
120	9	0.60	2	0.13	0.37	1.06E-01
121	4	0.27	3	0.20	0.23	4.28E-02
122	2	0.13	1	0.07	0.10	7.86E-03
123	3	0.20	1	0.07	0.13	1.40E-02
124	2	0.13	2	0.13	0.13	1.40E-02
125	7	0.47	2.5	0.17	0.32	7.88E-02
126	2.5	0.17	1.5	0.10	0.13	1.40E-02
127	2	0.13	1	0.07	0.10	7.86E-03
128	2.5	0.17	1.5	0.10	0.13	1.40E-02
129	3.5	0.23	1	0.07	0.15	1.77E-02
130	2	0.13	1	0.07	0.10	7.86E-03
131	3.5	0.23	1	0.07	0.15	1.77E-02
132	3.5	0.23	1.5	0.10	0.17	2.18E-02
133	4	0.27	2	0.13	0.20	3.14E-02
134	2	0.13	1.5	0.10	0.12	1.07E-02
135	3.5	0.23	1	0.07	0.15	1.77E-02
136	2	0.13	2	0.13	0.13	1.40E-02
137	2	0.13	1	0.07	0.10	7.86E-03
138	4	0.27	1	0.07	0.17	2.18E-02
139	4	0.27	2	0.13	0.20	3.14E-02
140	5	0.33	3	0.20	0.27	5.59E-02
141	8.5	0.57	2	0.13	0.35	9.62E-02
142	3	0.20	1.5	0.10	0.15	1.77E-02
143	7	0.47	0.5	0.03	0.25	4.91E-02
144	3	0.20	2.5	0.17	0.18	2.64E-02
145	3	0.20	1.5	0.10	0.15	1.77E-02
146	2.5	0.17	2	0.13	0.15	1.77E-02
147	2.5	0.17	2	0.13	0.15	1.77E-02
148	3	0.20	0.5	0.03	0.12	1.07E-02
149	2.5	0.17	1.5	0.10	0.13	1.40E-02
150	6.5	0.43	3	0.20	0.32	7.88E-02
151	4	0.27	2	0.13	0.20	3.14E-02
152	5	0.33	1.5	0.10	0.22	3.69E-02
153	3.5	0.23	0.5	0.03	0.13	1.40E-02
154	10.5	0.70	3	0.20	0.45	1.59E-01
155	9	0.60	3	0.20	0.40	1.26E-01

PORE	MAX. DIA. (mm)	MAX. DIA. (µm)	MIN. DIA. (mm)	MIN. DIA. (µm)	AVE. DIA. (µm)	AREA (µm)(µm)
156	2	0.13	1	0.07	0.10	7.86E-03
157	3	0.20	1.5	0.10	0.15	1.77E-02
158	2	0.13	1	0.07	0.10	7.86E-03
159	3	0.20	2	0.13	0.17	2.18E-02
160	2	0.13	1.5	0.10	0.12	1.07E-02
161	4	0.27	2	0.13	0.20	3.14E-02
162	2	0.13	2	0.13	0.13	1.40E-02
163	3	0.20	0.5	0.03	0.12	1.07E-02
164	3	0.20	1.5	0.10	0.15	1.77E-02
165	2	0.13	1	0.07	0.10	7.86E-03
166	3.5	0.23	1.5	0.10	0.17	2.18E-02
167	2.5	0.17	1.5	0.10	0.13	1.40E-02
168	7	0.47	1.5	0.10	0.28	6.31E-02
169	2	0.13	1	0.07	0.10	7.86E-03
170	2	0.13	2	0.13	0.13	1.40E-02
171	5	0.33	1	0.07	0.20	3.14E-02
172	3	0.20	1	0.07	0.13	1.40E-02
173	2.5	0.17	1.5	0.10	0.13	1.40E-02
174	8.5	0.57	4.5	0.30	0.43	1.48E-01
175	5	0.33	2.5	0.17	0.25	4.91E-02
176	1.5	0.10	1.5	0.10	0.10	7.86E-03
177	1.5	0.10	1	0.07	0.08	5.46E-03
178	7	0.47	2	0.13	0.30	7.07E-02
179	3	0.20	1	0.07	0.13	1.40E-02
180	2.5	0.17	2	0.13	0.15	1.77E-02
181	2	0.13	1	0.07	0.10	7.86E-03
182	1	0.07	1	0.07	0.07	3.49E-03
183	3	0.20	1.5	0.10	0.15	1.77E-02
184	3	0.20	1.5	0.10	0.15	1.77E-02
185	1.5	0.10	1	0.07	0.08	5.46E-03
186	3.5	0.23	2	0.13	0.18	2.64E-02
187	5	0.33	1	0.07	0.20	3.14E-02
188	1.5	0.10	1	0.07	0.08	5.46E-03
189	3.5	0.23	2	0.13	0.18	2.64E-02
190	2	0.13	1	0.07	0.10	7.86E-03
191	1	0.07	1	0.07	0.07	3.49E-03
192	2	0.13	0.5	0.03	0.08	5.46E-03
193	3	0.20	0.5	0.03	0.12	1.07E-02
194	2	0.13	1	0.07	0.10	7.86E-03
195	2	0.13	1	0.07	0.10	7.86E-03
196	1.5	0.10	1	0.07	0.08	5.46E-03

PORE	MAX. DIA. (mm)	MAX. DIA. (μm)	MIN. DIA. (mm)	MIN. DIA. (μm)	AVE. DIA. (μm)	AREA (μm)(μm)
197	1	0.07	1	0.07	0.07	3.49E-03
198	2	0.13	2	0.13	0.13	1.40E-02
199	4	0.27	1	0.07	0.17	2.18E-02
200	2.5	0.17	1	0.07	0.12	1.07E-02
201	1.5	0.10	0.5	0.03	0.07	3.49E-03
202	1	0.07	1	0.07	0.07	3.49E-03
203	2	0.13	1	0.07	0.10	7.86E-03
204	4	0.27	1	0.07	0.17	2.18E-02
205	4	0.27	1.5	0.10	0.18	2.64E-02
206	2	0.13	1	0.07	0.10	7.86E-03
207	2	0.13	1	0.07	0.10	7.86E-03
208	1	0.07	0.5	0.03	0.05	1.96E-03
209	4.5	0.30	1.5	0.10	0.20	3.14E-02
210	2	0.13	1	0.07	0.10	7.86E-03
211	2	0.13	1	0.07	0.10	7.86E-03
212	2	0.13	1	0.07	0.10	7.86E-03
213	2.5	0.17	1	0.07	0.12	1.07E-02
214	8.5	0.57	2.5	0.17	0.37	1.06E-01
215	2	0.13	1	0.07	0.10	7.86E-03
216	3	0.20	1	0.07	0.13	1.40E-02
217	3.5	0.23	1	0.07	0.15	1.77E-02
218	1	0.07	1	0.07	0.07	3.49E-03
219	2	0.13	1	0.07	0.10	7.86E-03
220	2	0.13	2	0.13	0.13	1.40E-02
221	3	0.20	2	0.13	0.17	2.18E-02
222	2	0.13	0.5	0.03	0.08	5.46E-03
223	1	0.07	0.5	0.03	0.05	1.96E-03
224	3	0.20	2	0.13	0.17	2.18E-02
225	3	0.20	2	0.13	0.17	2.18E-02
226	1	0.07	0.5	0.03	0.05	1.96E-03
227	2	0.13	1	0.07	0.10	7.86E-03
228	6	0.40	4	0.27	0.33	8.73E-02
229	4	0.27	1	0.07	0.17	2.18E-02
230	3	0.20	1.5	0.10	0.15	1.77E-02
231	2.5	0.17	0.5	0.03	0.10	7.86E-03
232	3	0.20	1	0.07	0.13	1.40E-02
233	6	0.40	2.5	0.17	0.28	6.31E-02
234	2	0.13	1	0.07	0.10	7.86E-03
235	2	0.13	1	0.07	0.10	7.86E-03
236	2.5	0.17	2	0.13	0.15	1.77E-02
237	2.5	0.17	2	0.13	0.15	1.77E-02

PORE	MAX. DIA. (mm)	MAX. DIA. (μm)	MIN. DIA. (mm)	MIN. DIA. (μm)	AVE. DIA. (μm)	AREA (μm)(μm)
238	2.5	0.17	1.5	0.10	0.13	1.40E-02
239	2	0.13	2	0.13	0.13	1.40E-02
240	3.5	0.23	1.5	0.10	0.17	2.18E-02
241	3	0.20	1	0.07	0.13	1.40E-02
242	2	0.13	1	0.07	0.10	7.86E-03
243	1.5	0.10	1	0.07	0.08	5.46E-03
244	2	0.13	2	0.13	0.13	1.40E-02
245	2.5	0.17	1.5	0.10	0.13	1.40E-02
246	4	0.27	1.5	0.10	0.18	2.64E-02
247	2.5	0.17	2	0.13	0.15	1.77E-02
248	3.5	0.23	2	0.13	0.18	2.64E-02
249	3.5	0.23	2	0.13	0.18	2.64E-02
250	4.5	0.30	1	0.07	0.18	2.64E-02
251	2.5	0.17	1.5	0.10	0.13	1.40E-02
252	2	0.13	1	0.07	0.10	7.86E-03
253	3	0.20	1	0.07	0.13	1.40E-02
254	6.5	0.43	1	0.07	0.25	4.91E-02
255	4.5	0.30	1	0.07	0.18	2.64E-02
256	5	0.33	0.5	0.03	0.18	2.64E-02
257	2.5	0.17	1	0.07	0.12	1.07E-02
258	2.5	0.17	1	0.07	0.12	1.07E-02
259	3	0.20	1	0.07	0.13	1.40E-02
260	2	0.13	1	0.07	0.10	7.86E-03
261	3	0.20	2	0.13	0.17	2.18E-02
262	4	0.27	4	0.27	0.27	5.59E-02
263	3	0.20	1.5	0.10	0.15	1.77E-02
264	9.5	0.63	4	0.27	0.45	1.59E-01
265	2	0.13	1	0.07	0.10	7.86E-03
266	4	0.27	1	0.07	0.17	2.18E-02
267	2.5	0.17	1	0.07	0.12	1.07E-02
268	2	0.13	2	0.13	0.13	1.40E-02
269	1	0.07	1	0.07	0.07	3.49E-03
270	1.5	0.10	1.5	0.10	0.10	7.86E-03
271	2	0.13	1	0.07	0.10	7.86E-03
272	4	0.27	1	0.07	0.17	2.18E-02
273	1.5	0.10	1.5	0.10	0.10	7.86E-03
274	6	0.40	1	0.07	0.23	4.28E-02
275	2	0.13	1	0.07	0.10	7.86E-03
276	3	0.20	1	0.07	0.13	1.40E-02
277	3	0.20	1.5	0.10	0.15	1.77E-02
278	3	0.20	3	0.20	0.20	3.14E-02

PORE	MAX. DIA. (mm)	MAX. DIA. (μm)	MIN. DIA. (mm)	MIN. DIA. (μm)	AVE. DIA. (μm)	AREA (μm)(μm)
279	2	0.13	1	0.07	0.10	7.86E-03
280	3.5	0.23	1	0.07	0.15	1.77E-02
281	2.5	0.17	1	0.07	0.12	1.07E-02
282	2	0.13	1.5	0.10	0.12	1.07E-02
283	2	0.13	2	0.13	0.13	1.40E-02
284	1.5	0.10	1	0.07	0.08	5.46E-03
285	1	0.07	0.5	0.03	0.05	1.96E-03
286	4	0.27	1.5	0.10	0.18	2.64E-02
287	5	0.33	2.5	0.17	0.25	4.91E-02
288	6	0.40	5	0.33	0.37	1.06E-01
289	3	0.20	1.5	0.10	0.15	1.77E-02
290	3	0.20	1.5	0.10	0.15	1.77E-02
291	3	0.20	1.5	0.10	0.15	1.77E-02
292	2.5	0.17	2	0.13	0.15	1.77E-02
293	3	0.20	1	0.07	0.13	1.40E-02
294	3	0.20	1.5	0.10	0.15	1.77E-02
295	1	0.07	1	0.07	0.07	3.49E-03
296	4	0.27	2	0.13	0.20	3.14E-02
297	2.5	0.17	1	0.07	0.12	1.07E-02
298	2.5	0.17	1.5	0.10	0.13	1.40E-02
299	1.5	0.10	1	0.07	0.08	5.46E-03
300	2	0.13	1	0.07	0.10	7.86E-03
301	1	0.07	0.5	0.03	0.05	1.96E-03
302	5	0.33	2	0.13	0.23	4.28E-02
303	4	0.27	2.5	0.17	0.22	3.69E-02
304	5	0.33	2.5	0.17	0.25	4.91E-02
305	3.5	0.23	1.5	0.10	0.17	2.18E-02
306	8.5	0.57	1.5	0.10	0.33	8.73E-02
307	2.5	0.17	2	0.13	0.15	1.77E-02
308	2	0.13	1.5	0.10	0.12	1.07E-02
309	3	0.20	1	0.07	0.13	1.40E-02
310	3	0.20	2	0.13	0.17	2.18E-02
311	4	0.27	2	0.13	0.20	3.14E-02
312	2.5	0.17	1	0.07	0.12	1.07E-02
313	1	0.07	0.5	0.03	0.05	1.96E-03
314	1	0.07	0.5	0.03	0.05	1.96E-03
315	7	0.47	2	0.13	0.30	7.07E-02
316	2	0.13	2	0.13	0.13	1.40E-02
317	2.5	0.17	1.5	0.10	0.13	1.40E-02
318	5	0.33	2	0.13	0.23	4.28E-02
319	4	0.27	1	0.07	0.17	2.18E-02

PORE	MAX. DIA. (mm)	MAX. DIA. (µm)	MIN. DIA. (mm)	MIN. DIA. (µm)	AVE. DIA. (µm)	AREA (µm)(µm)
320	1.5	0.10	1	0.07	0.08	5.46E-03
321	1.5	0.10	1	0.07	0.08	5.46E-03
322	2	0.13	1.5	0.10	0.12	1.07E-02
323	2	0.13	1.5	0.10	0.12	1.07E-02
324	5	0.33	2.5	0.17	0.25	4.91E-02
325	3	0.20	0.5	0.03	0.12	1.07E-02
326	5	0.33	4	0.27	0.30	7.07E-02
327	2	0.13	1	0.07	0.10	7.86E-03
328	3	0.20	1.5	0.10	0.15	1.77E-02
329	2	0.13	2	0.13	0.13	1.40E-02
330	7	0.47	2	0.13	0.30	7.07E-02
331	4	0.27	1.5	0.10	0.18	2.64E-02
332	2.5	0.17	1.5	0.10	0.13	1.40E-02
333	1.5	0.10	0.5	0.03	0.07	3.49E-03
334	3	0.20	1.5	0.10	0.15	1.77E-02
335	3.5	0.23	1.5	0.10	0.17	2.18E-02
336	2	0.13	1	0.07	0.10	7.86E-03
337	1	0.07	0.5	0.03	0.05	1.96E-03
338	1	0.07	0.5	0.03	0.05	1.96E-03
339	4	0.27	2	0.13	0.20	3.14E-02
340	3	0.20	2	0.13	0.17	2.18E-02
341	8.5	0.57	3	0.20	0.38	1.15E-01
342	3	0.20	1	0.07	0.13	1.40E-02
343	1	0.07	0.5	0.03	0.05	1.96E-03
344	1	0.07	1	0.07	0.07	3.49E-03
345	1	0.07	1	0.07	0.07	3.49E-03
346	2	0.13	1	0.07	0.10	7.86E-03
347	2.5	0.17	1.5	0.10	0.13	1.40E-02
348	3	0.20	2	0.13	0.17	2.18E-02
349	3.5	0.23	1.5	0.10	0.17	2.18E-02
350	3	0.20	2	0.13	0.17	2.18E-02
351	3.5	0.23	2	0.13	0.18	2.64E-02
352	1	0.07	1	0.07	0.07	3.49E-03
353	5	0.33	1.5	0.10	0.22	3.69E-02
354	2	0.13	1	0.07	0.10	7.86E-03
355	2.5	0.17	0.5	0.03	0.10	7.86E-03
356	1	0.07	0.5	0.03	0.05	1.96E-03
357	5	0.33	1	0.07	0.20	3.14E-02
358	1.5	0.10	1	0.07	0.08	5.46E-03
359	2	0.13	1	0.07	0.10	7.86E-03
360	1.5	0.10	1	0.07	0.08	5.46E-03

PORE	MAX. DIA. (mm)	MAX. DIA. (μm)	MIN. DIA. (mm)	MIN. DIA. (μm)	AVE. DIA. (μm)	AREA (μm)(μm)
361	1	0.07	0.5	0.03	0.05	1.96E-03
362	1	0.07	1	0.07	0.07	3.49E-03
363	2	0.13	1	0.07	0.10	7.86E-03
364	1.5	0.10	1	0.07	0.08	5.46E-03
365	4	0.27	1.5	0.10	0.18	2.64E-02
366	2.5	0.17	1	0.07	0.12	1.07E-02
367	2	0.13	2	0.13	0.13	1.40E-02
368	1	0.07	0.5	0.03	0.05	1.96E-03
369	5	0.33	1	0.07	0.20	3.14E-02
370	4	0.27	1.5	0.10	0.18	2.64E-02
371	4	0.27	1.5	0.10	0.18	2.64E-02
372	2	0.13	1	0.07	0.10	7.86E-03
373	2	0.13	0.5	0.03	0.08	5.46E-03
374	3	0.20	1	0.07	0.13	1.40E-02
375	5	0.33	1	0.07	0.20	3.14E-02
376	3	0.20	1	0.07	0.13	1.40E-02
377	3	0.20	1.5	0.10	0.15	1.77E-02
378	1	0.07	1	0.07	0.07	3.49E-03
379	4	0.27	1.5	0.10	0.18	2.64E-02
380	2	0.13	2	0.13	0.13	1.40E-02
381	2	0.13	2	0.13	0.13	1.40E-02
382	2	0.13	1.5	0.10	0.12	1.07E-02
383	2	0.13	1	0.07	0.10	7.86E-03
384	3.5	0.23	1	0.07	0.15	1.77E-02
385	2	0.13	0.5	0.03	0.08	5.46E-03
386	3	0.20	1	0.07	0.13	1.40E-02
387	3.5	0.23	1.5	0.10	0.17	2.18E-02
388	3.5	0.23	1	0.07	0.15	1.77E-02
389	1.5	0.10	1.5	0.10	0.10	7.86E-03
390	2	0.13	1	0.07	0.10	7.86E-03
391	2	0.13	1	0.07	0.10	7.86E-03
392	2	0.13	1	0.07	0.10	7.86E-03
393	1.5	0.10	1.5	0.10	0.10	7.86E-03
394	3	0.20	1	0.07	0.13	1.40E-02
395	3	0.20	1	0.07	0.13	1.40E-02
396	1.5	0.10	1.5	0.10	0.10	7.86E-03
397	3	0.20	2	0.13	0.17	2.18E-02
398	4	0.27	1	0.07	0.17	2.18E-02
399	7	0.47	1	0.07	0.27	5.59E-02
400	4	0.27	1	0.07	0.17	2.18E-02
401	2	0.13	0.5	0.03	0.08	5.46E-03

PORE	MAX. DIA. (mm)	MAX. DIA. (μm)	MIN. DIA. (mm)	MIN. DIA. (μm)	AVE. DIA. (μm)	AREA (μm)(μm)
402	3	0.20	2.5	0.17	0.18	2.64E-02
403	2	0.13	0.5	0.03	0.08	5.46E-03
404	5.5	0.37	1	0.07	0.22	3.69E-02
405	5	0.33	0.5	0.03	0.18	2.64E-02
406	3.5	0.23	1	0.07	0.15	1.77E-02
407	3	0.20	2	0.13	0.17	2.18E-02
408	5	0.33	2	0.13	0.23	4.28E-02
409	3	0.20	1	0.07	0.13	1.40E-02
410	2.5	0.17	1	0.07	0.12	1.07E-02
411	1	0.07	0.5	0.03	0.05	1.96E-03
412	1	0.07	1	0.07	0.07	3.49E-03
413	3.5	0.23	2	0.13	0.18	2.64E-02
414	3	0.20	0.5	0.03	0.12	1.07E-02
415	1	0.07	0.5	0.03	0.05	1.96E-03
416	3.5	0.23	1.5	0.10	0.17	2.18E-02
417	1.5	0.10	1.5	0.10	0.10	7.86E-03
418	2.5	0.17	2	0.13	0.15	1.77E-02
419	2	0.13	1	0.07	0.10	7.86E-03
420	2	0.13	1	0.07	0.10	7.86E-03
421	2	0.13	1	0.07	0.10	7.86E-03
422	2	0.13	1	0.07	0.10	7.86E-03
423	2	0.13	1	0.07	0.10	7.86E-03
424	3	0.20	2	0.13	0.17	2.18E-02
425	3	0.20	1.5	0.10	0.15	1.77E-02
426	2	0.13	1	0.07	0.10	7.86E-03
427	2	0.13	1.5	0.10	0.12	1.07E-02
428	2	0.13	1	0.07	0.10	7.86E-03
429	2	0.13	2	0.13	0.13	1.40E-02
430	2	0.13	2	0.13	0.13	1.40E-02
431	2	0.13	1	0.07	0.10	7.86E-03
432	3	0.20	1	0.07	0.13	1.40E-02
433	2	0.13	1	0.07	0.10	7.86E-03
434	2	0.13	1	0.07	0.10	7.86E-03
435	2.5	0.17	2	0.13	0.15	1.77E-02
436	4	0.27	1.5	0.10	0.18	2.64E-02
437	4	0.27	3	0.20	0.23	4.28E-02
438	3.5	0.23	2	0.13	0.18	2.64E-02
439	1	0.07	0.5	0.03	0.05	1.96E-03
440	7	0.47	3	0.20	0.33	8.73E-02
441	3	0.20	1	0.07	0.13	1.40E-02
442	3	0.20	1	0.07	0.13	1.40E-02

PORE	MAX. DIA. (mm)	MAX. DIA. (μm)	MIN. DIA. (mm)	MIN. DIA. (μm)	AVE. DIA. (μm)	AREA (μm)(μm)
443	4	0.27	1	0.07	0.17	2.18E-02
444	3	0.20	0.5	0.03	0.12	1.07E-02
445	1.5	0.10	0.5	0.03	0.07	3.49E-03
AVE.	3.048596	0.20	1.451404	0.10	0.15	9.99E+00
STD. DEV.		0.108113		0.05		

FLOW RATE:	100 ml/min
SAMPLE ID:	O4/a
S:	1
PHOTO NO.:	52
MAGNIFICATION:	15.0 K
NO. OF PORES:	589

PORE	MAX. DIA. (mm)	MAX. DIA. (μm)	MIN. DIA. (mm)	MIN. DIA. (μm)	AVE. DIA. (μm)	AREA (μm)(μm)
1	2	0.13	1.5	0.10	0.12	1.07E-02
2	2	0.13	2	0.13	0.13	1.40E-02
3	2	0.13	1.5	0.10	0.12	1.07E-02
4	3	0.20	2	0.13	0.17	2.18E-02
5	2	0.13	1	0.07	0.10	7.86E-03
6	2	0.13	1	0.07	0.10	7.86E-03
7	1	0.07	1	0.07	0.07	3.49E-03
8	1.5	0.10	1	0.07	0.08	5.46E-03
9	3	0.20	1.5	0.10	0.15	1.77E-02
10	1	0.07	0.5	0.03	0.05	1.96E-03
11	3	0.20	1.5	0.10	0.15	1.77E-02
12	6	0.40	2	0.13	0.27	5.59E-02
13	2	0.13	1	0.07	0.10	7.86E-03
14	2.5	0.17	1.5	0.10	0.13	1.40E-02
15	4	0.27	2	0.13	0.20	3.14E-02
16	5	0.33	3	0.20	0.27	5.59E-02
17	2	0.13	1	0.07	0.10	7.86E-03
18	1.5	0.10	1	0.07	0.08	5.46E-03
19	3	0.20	2	0.13	0.17	2.18E-02
20	2.5	0.17	1.5	0.10	0.13	1.40E-02
21	3.5	0.23	1.5	0.10	0.17	2.18E-02
22	3	0.20	1.5	0.10	0.15	1.77E-02
23	2	0.13	1	0.07	0.10	7.86E-03
24	2	0.13	1	0.07	0.10	7.86E-03
25	3	0.20	1.5	0.10	0.15	1.77E-02
26	2	0.13	0.5	0.03	0.08	5.46E-03
27	2	0.13	1	0.07	0.10	7.86E-03
28	2	0.13	1.5	0.10	0.12	1.07E-02
29	2	0.13	2	0.13	0.13	1.40E-02
30	2	0.13	1.5	0.10	0.12	1.07E-02
31	2	0.13	2	0.13	0.13	1.40E-02
32	2.5	0.17	1	0.07	0.12	1.07E-02

PORE	MAX. DIA. (mm)	MAX. DIA. (µm)	MIN. DIA. (mm)	MIN. DIA. (µm)	AVE. DIA. (µm)	AREA (µm)(µm)
33	3.5	0.23	0.5	0.03	0.13	1.40E-02
34	3	0.20	2.5	0.17	0.18	2.64E-02
35	3	0.20	1.5	0.10	0.15	1.77E-02
36	2	0.13	1	0.07	0.10	7.86E-03
37	4.5	0.30	2	0.13	0.22	3.69E-02
38	3	0.20	1.5	0.10	0.15	1.77E-02
39	2	0.13	1	0.07	0.10	7.86E-03
40	1.5	0.10	1	0.07	0.08	5.46E-03
41	4	0.27	1.5	0.10	0.18	2.64E-02
42	1	0.07	0.5	0.03	0.05	1.96E-03
43	2	0.13	1	0.07	0.10	7.86E-03
44	2	0.13	1	0.07	0.10	7.86E-03
45	2.5	0.17	1	0.07	0.12	1.07E-02
46	3	0.20	1.5	0.10	0.15	1.77E-02
47	3.5	0.23	1	0.07	0.15	1.77E-02
48	2.5	0.17	1.5	0.10	0.13	1.40E-02
49	1.5	0.10	1.5	0.10	0.10	7.86E-03
50	1.5	0.10	1.5	0.10	0.10	7.86E-03
51	2	0.13	1	0.07	0.10	7.86E-03
52	2.5	0.17	1.5	0.10	0.13	1.40E-02
53	1	0.07	1	0.07	0.07	3.49E-03
54	2	0.13	1.5	0.10	0.12	1.07E-02
55	4	0.27	1	0.07	0.17	2.18E-02
56	2	0.13	1	0.07	0.10	7.86E-03
57	2	0.13	2	0.13	0.13	1.40E-02
58	2.5	0.17	2	0.13	0.15	1.77E-02
59	1.5	0.10	1	0.07	0.08	5.46E-03
60	1.5	0.10	1.5	0.10	0.10	7.86E-03
61	4	0.27	1	0.07	0.17	2.18E-02
62	2	0.13	1	0.07	0.10	7.86E-03
63	1	0.07	1	0.07	0.07	3.49E-03
64	4.5	0.30	2	0.13	0.22	3.69E-02
65	2	0.13	1.5	0.10	0.12	1.07E-02
66	1	0.07	0.5	0.03	0.05	1.96E-03
67	2.5	0.17	0.5	0.03	0.10	7.86E-03
68	0.5	0.03	0.5	0.03	0.03	8.73E-04
69	4	0.27	2.5	0.17	0.22	3.69E-02
70	2.5	0.17	2	0.13	0.15	1.77E-02
71	2	0.13	1	0.07	0.10	7.86E-03
72	2.5	0.17	1	0.07	0.12	1.07E-02
73	2	0.13	1	0.07	0.10	7.86E-03

PORE	MAX. DIA. (mm)	MAX. DIA. (μm)	MIN. DIA. (mm)	MIN. DIA. (μm)	AVE. DIA. (μm)	AREA (μm)(μm)
74	1	0.07	1	0.07	0.07	3.49E-03
75	1.5	0.10	1.5	0.10	0.10	7.86E-03
76	2	0.13	1	0.07	0.10	7.86E-03
77	5	0.33	2.5	0.17	0.25	4.91E-02
78	3	0.20	1	0.07	0.13	1.40E-02
79	3	0.20	1.5	0.10	0.15	1.77E-02
80	2.5	0.17	1	0.07	0.12	1.07E-02
81	1.5	0.10	1	0.07	0.08	5.46E-03
82	2	0.13	1	0.07	0.10	7.86E-03
83	2.5	0.17	1	0.07	0.12	1.07E-02
84	1	0.07	0.5	0.03	0.05	1.96E-03
85	1	0.07	1	0.07	0.07	3.49E-03
86	2	0.13	1	0.07	0.10	7.86E-03
87	3	0.20	1.5	0.10	0.15	1.77E-02
88	2	0.13	1	0.07	0.10	7.86E-03
89	1.5	0.10	0.5	0.03	0.07	3.49E-03
90	6	0.40	4	0.27	0.33	8.73E-02
91	2	0.13	1	0.07	0.10	7.86E-03
92	2.5	0.17	1.5	0.10	0.13	1.40E-02
93	2	0.13	1	0.07	0.10	7.86E-03
94	2	0.13	1	0.07	0.10	7.86E-03
95	2	0.13	1	0.07	0.10	7.86E-03
96	3	0.20	2	0.13	0.17	2.18E-02
97	5	0.33	1	0.07	0.20	3.14E-02
98	3	0.20	2	0.13	0.17	2.18E-02
99	4	0.27	2.5	0.17	0.22	3.69E-02
100	3	0.20	2	0.13	0.17	2.18E-02
101	1.5	0.10	1.5	0.10	0.10	7.86E-03
102	2	0.13	0.5	0.03	0.08	5.46E-03
103	2	0.13	2	0.13	0.13	1.40E-02
104	2.5	0.17	2	0.13	0.15	1.77E-02
105	3	0.20	1.5	0.10	0.15	1.77E-02
106	2	0.13	0.5	0.03	0.08	5.46E-03
107	1.5	0.10	1	0.07	0.08	5.46E-03
108	0.5	0.03	0.5	0.03	0.03	8.73E-04
109	1.5	0.10	0.5	0.03	0.07	3.49E-03
110	3.5	0.23	1	0.07	0.15	1.77E-02
111	1.5	0.10	1	0.07	0.08	5.46E-03
112	2	0.13	2	0.13	0.13	1.40E-02
113	2	0.13	2	0.13	0.13	1.40E-02
114	2.5	0.17	2	0.13	0.15	1.77E-02

PORE	MAX. DIA. (mm)	MAX. DIA. (μm)	MIN. DIA. (mm)	MIN. DIA. (μm)	AVE. DIA. (μm)	AREA (μm)(μm)
115	3	0.20	1	0.07	0.13	1.40E-02
116	4.5	0.30	2	0.13	0.22	3.69E-02
117	3	0.20	1	0.07	0.13	1.40E-02
118	1.5	0.10	0.5	0.03	0.07	3.49E-03
119	1.5	0.10	0.5	0.03	0.07	3.49E-03
120	2.5	0.17	1	0.07	0.12	1.07E-02
121	2	0.13	2	0.13	0.13	1.40E-02
122	2	0.13	1	0.07	0.10	7.86E-03
123	2.5	0.17	1.5	0.10	0.13	1.40E-02
124	1	0.07	1	0.07	0.07	3.49E-03
125	1.5	0.10	1	0.07	0.08	5.46E-03
126	1	0.07	0.5	0.03	0.05	1.96E-03
127	2	0.13	1	0.07	0.10	7.86E-03
128	1	0.07	0.5	0.03	0.05	1.96E-03
129	1.5	0.10	1	0.07	0.08	5.46E-03
130	0.5	0.03	0.5	0.03	0.03	8.73E-04
131	1	0.07	0.5	0.03	0.05	1.96E-03
132	1.5	0.10	0.5	0.03	0.07	3.49E-03
133	1	0.07	1	0.07	0.07	3.49E-03
134	3.5	0.23	1	0.07	0.15	1.77E-02
135	3	0.20	1	0.07	0.13	1.40E-02
136	2.5	0.17	1.5	0.10	0.13	1.40E-02
137	3	0.20	2	0.13	0.17	2.18E-02
138	10	0.67	4	0.27	0.47	1.71E-01
139	5	0.33	0.4	0.03	0.18	2.55E-02
140	6	0.40	1.5	0.10	0.25	4.91E-02
141	2.5	0.17	1.5	0.10	0.13	1.40E-02
142	2	0.13	1	0.07	0.10	7.86E-03
143	3	0.20	1.5	0.10	0.15	1.77E-02
144	2.5	0.17	1	0.07	0.12	1.07E-02
145	2.5	0.17	1.5	0.10	0.13	1.40E-02
146	1.5	0.10	1	0.07	0.08	5.46E-03
147	1.5	0.10	1	0.07	0.08	5.46E-03
148	2	0.13	1	0.07	0.10	7.86E-03
149	2	0.13	1	0.07	0.10	7.86E-03
150	1.5	0.10	1	0.07	0.08	5.46E-03
151	1	0.07	1	0.07	0.07	3.49E-03
152	3	0.20	1	0.07	0.13	1.40E-02
153	2	0.13	1	0.07	0.10	7.86E-03
154	4	0.27	1	0.07	0.17	2.18E-02
155	2	0.13	1.5	0.10	0.12	1.07E-02

PORE	MAX. DIA. (mm)	MAX. DIA. (µm)	MIN. DIA. (mm)	MIN. DIA. (µm)	AVE. DIA. (µm)	AREA (µm)(µm)
156	2	0.13	1	0.07	0.10	7.86E-03
157	1.5	0.10	1	0.07	0.08	5.46E-03
158	1	0.07	1	0.07	0.07	3.49E-03
159	2	0.13	0.5	0.03	0.08	5.46E-03
160	1.5	0.10	1	0.07	0.08	5.46E-03
161	2	0.13	1	0.07	0.10	7.86E-03
162	2	0.13	1	0.07	0.10	7.86E-03
163	1.5	0.10	1	0.07	0.08	5.46E-03
164	1.5	0.10	1	0.07	0.08	5.46E-03
165	3	0.20	0.5	0.03	0.12	1.07E-02
166	1.5	0.10	0.5	0.03	0.07	3.49E-03
167	2.5	0.17	1	0.07	0.12	1.07E-02
168	2	0.13	1	0.07	0.10	7.86E-03
169	1.5	0.10	1	0.07	0.08	5.46E-03
170	2	0.13	0.5	0.03	0.08	5.46E-03
171	1	0.07	1	0.07	0.07	3.49E-03
172	2	0.13	1	0.07	0.10	7.86E-03
173	1.5	0.10	0.5	0.03	0.07	3.49E-03
174	2	0.13	1	0.07	0.10	7.86E-03
175	2	0.13	0.5	0.03	0.08	5.46E-03
176	2	0.13	0.5	0.03	0.08	5.46E-03
177	2	0.13	0.5	0.03	0.08	5.46E-03
178	2	0.13	2	0.13	0.13	1.40E-02
179	3	0.20	1.5	0.10	0.15	1.77E-02
180	3	0.20	1	0.07	0.13	1.40E-02
181	10	0.67	6	0.40	0.53	2.23E-01
182	4	0.27	2	0.13	0.20	3.14E-02
183	1.5	0.10	0.5	0.03	0.07	3.49E-03
184	3	0.20	1.5	0.10	0.15	1.77E-02
185	1.5	0.10	1	0.07	0.08	5.46E-03
186	2	0.13	1.5	0.10	0.12	1.07E-02
187	2.5	0.17	2.5	0.17	0.17	2.18E-02
188	2	0.13	1.5	0.10	0.12	1.07E-02
189	2.5	0.17	1	0.07	0.12	1.07E-02
190	0.5	0.03	0.5	0.03	0.03	8.73E-04
191	2	0.13	1.5	0.10	0.12	1.07E-02
192	2	0.13	1.5	0.10	0.12	1.07E-02
193	0.5	0.03	0.5	0.03	0.03	8.73E-04
194	0.5	0.03	0.5	0.03	0.03	8.73E-04
195	0.5	0.03	0.5	0.03	0.03	8.73E-04
196	4	0.27	3	0.20	0.23	4.28E-02

PORE	MAX. DIA. (mm)	MAX. DIA. (μm)	MIN. DIA. (mm)	MIN. DIA. (μm)	AVE. DIA. (μm)	AREA (μm)(μm)
197	4.5	0.30	2	0.13	0.22	3.69E-02
198	2	0.13	1.5	0.10	0.12	1.07E-02
199	4	0.27	1	0.07	0.17	2.18E-02
200	1.5	0.10	1	0.07	0.08	5.46E-03
201	2.5	0.17	0.5	0.03	0.10	7.86E-03
202	2	0.13	1	0.07	0.10	7.86E-03
203	2	0.13	2	0.13	0.13	1.40E-02
204	2	0.13	1.5	0.10	0.12	1.07E-02
205	2	0.13	1.5	0.10	0.12	1.07E-02
206	3	0.20	2	0.13	0.17	2.18E-02
207	2.5	0.17	2	0.13	0.15	1.77E-02
208	1	0.07	1	0.07	0.07	3.49E-03
209	2	0.13	1.5	0.10	0.12	1.07E-02
210	2	0.13	1.5	0.10	0.12	1.07E-02
211	2.5	0.17	0.5	0.03	0.10	7.86E-03
212	2	0.13	0.5	0.03	0.08	5.46E-03
213	1.5	0.10	1	0.07	0.08	5.46E-03
214	1.5	0.10	1	0.07	0.08	5.46E-03
215	2.5	0.17	1.5	0.10	0.13	1.40E-02
216	3	0.20	1	0.07	0.13	1.40E-02
217	3	0.20	1.5	0.10	0.15	1.77E-02
218	3.5	0.23	2	0.13	0.18	2.64E-02
219	3	0.20	1.5	0.10	0.15	1.77E-02
220	2	0.13	2	0.13	0.13	1.40E-02
221	1.5	0.10	1	0.07	0.08	5.46E-03
222	1.5	0.10	0.5	0.03	0.07	3.49E-03
223	3	0.20	2	0.13	0.17	2.18E-02
224	3	0.20	2	0.13	0.17	2.18E-02
225	1	0.07	1	0.07	0.07	3.49E-03
226	1.5	0.10	1.5	0.10	0.10	7.86E-03
227	1.5	0.10	1.5	0.10	0.10	7.86E-03
228	3	0.20	2	0.13	0.17	2.18E-02
229	3	0.20	1	0.07	0.13	1.40E-02
230	4	0.27	1	0.07	0.17	2.18E-02
231	2	0.13	1.5	0.10	0.12	1.07E-02
232	2	0.13	1.5	0.10	0.12	1.07E-02
233	1	0.07	1	0.07	0.07	3.49E-03
234	6	0.40	1.5	0.10	0.25	4.91E-02
235	4	0.27	2	0.13	0.20	3.14E-02
236	3	0.20	1.5	0.10	0.15	1.77E-02
237	2.5	0.17	0.5	0.03	0.10	7.86E-03

PORE	MAX. DIA. (mm)	MAX. DIA. (µm)	MIN. DIA. (mm)	MIN. DIA. (µm)	AVE. DIA. (µm)	AREA (µm)(µm)
238	2	0.13	1	0.07	0.10	7.86E-03
239	1	0.07	1	0.07	0.07	3.49E-03
240	1.5	0.10	1.5	0.10	0.10	7.86E-03
241	1.5	0.10	1	0.07	0.08	5.46E-03
242	2.5	0.17	1.5	0.10	0.13	1.40E-02
243	2	0.13	1	0.07	0.10	7.86E-03
244	2.5	0.17	1	0.07	0.12	1.07E-02
245	1.5	0.10	0.5	0.03	0.07	3.49E-03
246	1	0.07	0.5	0.03	0.05	1.96E-03
247	2	0.13	0.5	0.03	0.08	5.46E-03
248	3.5	0.23	2	0.13	0.18	2.64E-02
249	3.5	0.23	2.5	0.17	0.20	3.14E-02
250	1.5	0.10	1.5	0.10	0.10	7.86E-03
251	2	0.13	1	0.07	0.10	7.86E-03
252	2	0.13	2	0.13	0.13	1.40E-02
253	2	0.13	1.5	0.10	0.12	1.07E-02
254	2	0.13	1	0.07	0.10	7.86E-03
255	1.5	0.10	0.5	0.03	0.07	3.49E-03
256	1	0.07	1	0.07	0.07	3.49E-03
257	1	0.07	1	0.07	0.07	3.49E-03
258	2	0.13	1	0.07	0.10	7.86E-03
259	2.5	0.17	1	0.07	0.12	1.07E-02
260	2	0.13	1	0.07	0.10	7.86E-03
261	2	0.13	1	0.07	0.10	7.86E-03
262	3	0.20	2	0.13	0.17	2.18E-02
263	2.5	0.17	1.5	0.10	0.13	1.40E-02
264	2	0.13	2	0.13	0.13	1.40E-02
265	2.5	0.17	1.5	0.10	0.13	1.40E-02
266	2	0.13	2	0.13	0.13	1.40E-02
267	2	0.13	1	0.07	0.10	7.86E-03
268	2	0.13	1.5	0.10	0.12	1.07E-02
269	1.5	0.10	1	0.07	0.08	5.46E-03
270	1.5	0.10	0.5	0.03	0.07	3.49E-03
271	2	0.13	1.5	0.10	0.12	1.07E-02
272	4	0.27	2	0.13	0.20	3.14E-02
273	2	0.13	1.5	0.10	0.12	1.07E-02
274	2	0.13	1	0.07	0.10	7.86E-03
275	4	0.27	3	0.20	0.23	4.28E-02
276	3	0.20	1	0.07	0.13	1.40E-02
277	6	0.40	3	0.20	0.30	7.07E-02
278	3	0.20	1.5	0.10	0.15	1.77E-02

PORE	MAX. DIA. (mm)	MAX. DIA. (μm)	MIN. DIA. (mm)	MIN. DIA. (μm)	AVE. DIA. (μm)	AREA (μm)(μm)
279	2	0.13	1.5	0.10	0.12	1.07E-02
280	2.5	0.17	1.5	0.10	0.13	1.40E-02
281	1.5	0.10	1.5	0.10	0.10	7.86E-03
282	2	0.13	1.5	0.10	0.12	1.07E-02
283	2.5	0.17	1.5	0.10	0.13	1.40E-02
284	3	0.20	2	0.13	0.17	2.18E-02
285	3	0.20	1	0.07	0.13	1.40E-02
286	1	0.07	0.5	0.03	0.05	1.96E-03
287	2	0.13	1	0.07	0.10	7.86E-03
288	2	0.13	1	0.07	0.10	7.86E-03
289	1	0.07	1	0.07	0.07	3.49E-03
290	2	0.13	1	0.07	0.10	7.86E-03
291	2	0.13	1	0.07	0.10	7.86E-03
292	4	0.27	1.5	0.10	0.18	2.64E-02
293	3.5	0.23	1.5	0.10	0.17	2.18E-02
294	2	0.13	1	0.07	0.10	7.86E-03
295	1.5	0.10	0.5	0.03	0.07	3.49E-03
296	4	0.27	0.5	0.03	0.15	1.77E-02
297	1	0.07	1	0.07	0.07	3.49E-03
298	1.5	0.10	1	0.07	0.08	5.46E-03
299	1.5	0.10	1	0.07	0.08	5.46E-03
300	1.5	0.10	0.5	0.03	0.07	3.49E-03
301	1	0.07	1	0.07	0.07	3.49E-03
302	2	0.13	1	0.07	0.10	7.86E-03
303	1.5	0.10	1.5	0.10	0.10	7.86E-03
304	1.5	0.10	0.5	0.03	0.07	3.49E-03
305	4.5	0.30	2	0.13	0.22	3.69E-02
306	2.5	0.17	2.5	0.17	0.17	2.18E-02
307	4	0.27	1.5	0.10	0.18	2.64E-02
308	2.5	0.17	2.5	0.17	0.17	2.18E-02
309	2.5	0.17	1.5	0.10	0.13	1.40E-02
310	3	0.20	1	0.07	0.13	1.40E-02
311	2	0.13	1	0.07	0.10	7.86E-03
312	2	0.13	0.5	0.03	0.08	5.46E-03
313	1.5	0.10	0.5	0.03	0.07	3.49E-03
314	0.5	0.03	0.5	0.03	0.03	8.73E-04
315	1	0.07	0.5	0.03	0.05	1.96E-03
316	3	0.20	0.5	0.03	0.12	1.07E-02
317	0.5	0.03	0.5	0.03	0.03	8.73E-04
318	0.5	0.03	0.5	0.03	0.03	8.73E-04
319	2	0.13	1.5	0.10	0.12	1.07E-02

PORE	MAX. DIA. (mm)	MAX. DIA. (μm)	MIN. DIA. (mm)	MIN. DIA. (μm)	AVE. DIA. (μm)	AREA (μm)(μm)
320	1.5	0.10	1	0.07	0.08	5.46E-03
321	2	0.13	1	0.07	0.10	7.86E-03
322	1.5	0.10	1.5	0.10	0.10	7.86E-03
323	2	0.13	1	0.07	0.10	7.86E-03
324	1	0.07	1	0.07	0.07	3.49E-03
325	1	0.07	1	0.07	0.07	3.49E-03
326	2.5	0.17	1	0.07	0.12	1.07E-02
327	2.5	0.17	1	0.07	0.12	1.07E-02
328	1	0.07	1	0.07	0.07	3.49E-03
329	2	0.13	1	0.07	0.10	7.86E-03
330	1.5	0.10	0.5	0.03	0.07	3.49E-03
331	3	0.20	1	0.07	0.13	1.40E-02
332	1.5	0.10	0.5	0.03	0.07	3.49E-03
333	2	0.13	2	0.13	0.13	1.40E-02
334	1	0.07	1	0.07	0.07	3.49E-03
335	1	0.07	0.5	0.03	0.05	1.96E-03
336	5	0.33	2	0.13	0.23	4.28E-02
337	4	0.27	1	0.07	0.17	2.18E-02
338	5	0.33	2	0.13	0.23	4.28E-02
339	2.5	0.17	1	0.07	0.12	1.07E-02
340	2	0.13	1	0.07	0.10	7.86E-03
341	2	0.13	2	0.13	0.13	1.40E-02
342	4	0.27	1.5	0.10	0.18	2.64E-02
343	1	0.07	0.5	0.03	0.05	1.96E-03
344	0.5	0.03	0.5	0.03	0.03	8.73E-04
345	0.5	0.03	0.5	0.03	0.03	8.73E-04
346	0.5	0.03	0.5	0.03	0.03	8.73E-04
347	3	0.20	1	0.07	0.13	1.40E-02
348	4.5	0.30	2.5	0.17	0.23	4.28E-02
349	2	0.13	1	0.07	0.10	7.86E-03
350	2.5	0.17	1.5	0.10	0.13	1.40E-02
351	2	0.13	2	0.13	0.13	1.40E-02
352	1.5	0.10	1	0.07	0.08	5.46E-03
353	3	0.20	1.5	0.10	0.15	1.77E-02
354	2.5	0.17	0.5	0.03	0.10	7.86E-03
355	2	0.13	1	0.07	0.10	7.86E-03
356	1	0.07	1	0.07	0.07	3.49E-03
357	1	0.07	0.5	0.03	0.05	1.96E-03
358	3.5	0.23	2.5	0.17	0.20	3.14E-02
359	4	0.27	1.5	0.10	0.18	2.64E-02
360	2	0.13	0.5	0.03	0.08	5.46E-03

PORE	MAX. DIA. (mm)	MAX. DIA. (μm)	MIN. DIA. (mm)	MIN. DIA. (μm)	AVE. DIA. (μm)	AREA (μm)(μm)
361	1.5	0.10	1.5	0.10	0.10	7.86E-03
362	2	0.13	2	0.13	0.13	1.40E-02
363	2	0.13	1	0.07	0.10	7.86E-03
364	1.5	0.10	1.5	0.10	0.10	7.86E-03
365	3	0.20	1	0.07	0.13	1.40E-02
366	3	0.20	0.5	0.03	0.12	1.07E-02
367	2	0.13	0.5	0.03	0.08	5.46E-03
368	4	0.27	2	0.13	0.20	3.14E-02
369	1	0.07	1	0.07	0.07	3.49E-03
370	1	0.07	1	0.07	0.07	3.49E-03
371	1.5	0.10	1	0.07	0.08	5.46E-03
372	1	0.07	1	0.07	0.07	3.49E-03
373	1.5	0.10	1.5	0.10	0.10	7.86E-03
374	1.5	0.10	1.5	0.10	0.10	7.86E-03
375	1.5	0.10	1	0.07	0.08	5.46E-03
376	2	0.13	0.5	0.03	0.08	5.46E-03
377	2	0.13	2	0.13	0.13	1.40E-02
378	2	0.13	1	0.07	0.10	7.86E-03
379	2	0.13	2	0.13	0.13	1.40E-02
380	3	0.20	2	0.13	0.17	2.18E-02
381	2	0.13	1.5	0.10	0.12	1.07E-02
382	2	0.13	1.5	0.10	0.12	1.07E-02
383	1.5	0.10	1	0.07	0.08	5.46E-03
384	4	0.27	3	0.20	0.23	4.28E-02
385	2	0.13	1	0.07	0.10	7.86E-03
386	2	0.13	1.5	0.10	0.12	1.07E-02
387	2.5	0.17	1.5	0.10	0.13	1.40E-02
388	1.5	0.10	0.5	0.03	0.07	3.49E-03
389	3	0.20	0.5	0.03	0.12	1.07E-02
390	3	0.20	2	0.13	0.17	2.18E-02
391	4	0.27	2	0.13	0.20	3.14E-02
392	4.5	0.30	2	0.13	0.22	3.69E-02
393	3	0.20	1.5	0.10	0.15	1.77E-02
394	2	0.13	1	0.07	0.10	7.86E-03
395	3	0.20	0.5	0.03	0.12	1.07E-02
396	1.5	0.10	1.5	0.10	0.10	7.86E-03
397	3	0.20	1	0.07	0.13	1.40E-02
398	1	0.07	0.5	0.03	0.05	1.96E-03
399	3	0.20	1	0.07	0.13	1.40E-02
400	2.5	0.17	1.5	0.10	0.13	1.40E-02
401	2	0.13	1.5	0.10	0.12	1.07E-02

PORE	MAX. DIA. (mm)	MAX. DIA. (μm)	MIN. DIA. (mm)	MIN. DIA. (μm)	AVE. DIA. (μm)	AREA (μm)(μm)
402	1.5	0.10	1	0.07	0.08	5.46E-03
403	2.5	0.17	2.5	0.17	0.17	2.18E-02
404	2	0.13	0.5	0.03	0.08	5.46E-03
405	1.5	0.10	1.5	0.10	0.10	7.86E-03
406	1	0.07	1	0.07	0.07	3.49E-03
407	2.5	0.17	1.5	0.10	0.13	1.40E-02
408	2	0.13	1.5	0.10	0.12	1.07E-02
409	4.5	0.30	1.5	0.10	0.20	3.14E-02
410	6	0.40	2	0.13	0.27	5.59E-02
411	3.5	0.23	2	0.13	0.18	2.64E-02
412	2.5	0.17	1.5	0.10	0.13	1.40E-02
413	2.5	0.17	1	0.07	0.12	1.07E-02
414	1.5	0.10	1.5	0.10	0.10	7.86E-03
415	2	0.13	2	0.13	0.13	1.40E-02
416	2	0.13	1	0.07	0.10	7.86E-03
417	2.5	0.17	0.5	0.03	0.10	7.86E-03
418	0.5	0.03	0.5	0.03	0.03	8.73E-04
419	7	0.47	3.5	0.23	0.35	9.62E-02
420	2	0.13	1	0.07	0.10	7.86E-03
421	2.5	0.17	2	0.13	0.15	1.77E-02
422	2.5	0.17	0.5	0.03	0.10	7.86E-03
423	3	0.20	1	0.07	0.13	1.40E-02
424	2	0.13	1	0.07	0.10	7.86E-03
425	2	0.13	1	0.07	0.10	7.86E-03
426	2	0.13	1	0.07	0.10	7.86E-03
427	3	0.20	2.5	0.17	0.18	2.64E-02
428	10	0.67	4.5	0.30	0.48	1.84E-01
429	2	0.13	1	0.07	0.10	7.86E-03
430	1	0.07	1	0.07	0.07	3.49E-03
431	1.5	0.10	1	0.07	0.08	5.46E-03
432	1.5	0.10	1	0.07	0.08	5.46E-03
433	2	0.13	1	0.07	0.10	7.86E-03
434	1	0.07	1	0.07	0.07	3.49E-03
435	1	0.07	1	0.07	0.07	3.49E-03
436	1	0.07	1	0.07	0.07	3.49E-03
437	2	0.13	1	0.07	0.10	7.86E-03
438	1.5	0.10	0.5	0.03	0.07	3.49E-03
439	2	0.13	0.5	0.03	0.08	5.46E-03
440	3	0.20	1.5	0.10	0.15	1.77E-02
441	2	0.13	1	0.07	0.10	7.86E-03
442	2	0.13	1	0.07	0.10	7.86E-03

PORE	MAX. DIA. (mm)	MAX. DIA. (μm)	MIN. DIA. (mm)	MIN. DIA. (μm)	AVE. DIA. (μm)	AREA (μm)(μm)
443	3.5	0.23	1.5	0.10	0.17	2.18E-02
444	3	0.20	1	0.07	0.13	1.40E-02
445	4	0.27	1	0.07	0.17	2.18E-02
446	4	0.27	1.5	0.10	0.18	2.64E-02
447	3.5	0.23	1.5	0.10	0.17	2.18E-02
448	3	0.20	1	0.07	0.13	1.40E-02
449	2	0.13	2	0.13	0.13	1.40E-02
450	1	0.07	0.5	0.03	0.05	1.96E-03
451	4	0.27	3	0.20	0.23	4.28E-02
452	2	0.13	1	0.07	0.10	7.86E-03
453	2	0.13	1	0.07	0.10	7.86E-03
454	1.5	0.10	1.5	0.10	0.10	7.86E-03
455	2.5	0.17	1	0.07	0.12	1.07E-02
456	1.5	0.10	1.5	0.10	0.10	7.86E-03
457	4.5	0.30	2	0.13	0.22	3.69E-02
458	2	0.13	0.5	0.03	0.08	5.46E-03
459	2.5	0.17	1	0.07	0.12	1.07E-02
460	3	0.20	1	0.07	0.13	1.40E-02
461	3	0.20	1.5	0.10	0.15	1.77E-02
462	2.5	0.17	1	0.07	0.12	1.07E-02
463	1.5	0.10	1	0.07	0.08	5.46E-03
464	3.5	0.23	3	0.20	0.22	3.69E-02
465	3	0.20	2	0.13	0.17	2.18E-02
466	2	0.13	1.5	0.10	0.12	1.07E-02
467	1	0.07	1	0.07	0.07	3.49E-03
468	1	0.07	1	0.07	0.07	3.49E-03
469	1.5	0.10	1.5	0.10	0.10	7.86E-03
470	1.5	0.10	1.5	0.10	0.10	7.86E-03
471	1.5	0.10	1	0.07	0.08	5.46E-03
472	2	0.13	1	0.07	0.10	7.86E-03
473	2	0.13	0.5	0.03	0.08	5.46E-03
474	0.5	0.03	0.5	0.03	0.03	8.73E-04
475	2	0.13	0.5	0.03	0.08	5.46E-03
476	1.5	0.10	1	0.07	0.08	5.46E-03
477	2.5	0.17	2	0.13	0.15	1.77E-02
478	2	0.13	1	0.07	0.10	7.86E-03
479	2	0.13	1.5	0.10	0.12	1.07E-02
480	2	0.13	1	0.07	0.10	7.86E-03
481	2.5	0.17	1	0.07	0.12	1.07E-02
482	2	0.13	1	0.07	0.10	7.86E-03
483	2	0.13	1	0.07	0.10	7.86E-03

PORE	MAX. DIA. (mm)	MAX. DIA. (μm)	MIN. DIA. (mm)	MIN. DIA. (μm)	AVE. DIA. (μm)	AREA (μm)(μm)
484	4	0.27	1	0.07	0.17	2.18E-02
485	2.5	0.17	1	0.07	0.12	1.07E-02
486	1.5	0.10	1.5	0.10	0.10	7.86E-03
487	5	0.33	2.5	0.17	0.25	4.91E-02
488	3.5	0.23	2	0.13	0.18	2.64E-02
489	3.5	0.23	1.5	0.10	0.17	2.18E-02
490	3	0.20	2	0.13	0.17	2.18E-02
491	3	0.20	1.5	0.10	0.15	1.77E-02
492	2.5	0.17	1.5	0.10	0.13	1.40E-02
493	2	0.13	1	0.07	0.10	7.86E-03
494	2	0.13	2	0.13	0.13	1.40E-02
495	2.5	0.17	1	0.07	0.12	1.07E-02
496	2.5	0.17	1.5	0.10	0.13	1.40E-02
497	3	0.20	2	0.13	0.17	2.18E-02
498	2	0.13	0.5	0.03	0.08	5.46E-03
499	2	0.13	2	0.13	0.13	1.40E-02
500	3.5	0.23	1	0.07	0.15	1.77E-02
501	4	0.27	1	0.07	0.17	2.18E-02
502	2	0.13	1	0.07	0.10	7.86E-03
503	2	0.13	1.5	0.10	0.12	1.07E-02
504	2	0.13	1.5	0.10	0.12	1.07E-02
505	2	0.13	2	0.13	0.13	1.40E-02
506	3	0.20	1	0.07	0.13	1.40E-02
507	2.5	0.17	1	0.07	0.12	1.07E-02
508	1	0.07	1	0.07	0.07	3.49E-03
509	1.5	0.10	1.5	0.10	0.10	7.86E-03
510	2	0.13	2	0.13	0.13	1.40E-02
511	1.5	0.10	1	0.07	0.08	5.46E-03
512	3	0.20	1	0.07	0.13	1.40E-02
513	4	0.27	1.5	0.10	0.18	2.64E-02
514	3	0.20	0.5	0.03	0.12	1.07E-02
515	1	0.07	1	0.07	0.07	3.49E-03
516	1.5	0.10	1	0.07	0.08	5.46E-03
517	1.5	0.10	1.5	0.10	0.10	7.86E-03
518	2	0.13	1	0.07	0.10	7.86E-03
519	2	0.13	2	0.13	0.13	1.40E-02
520	2	0.13	0.5	0.03	0.08	5.46E-03
521	3	0.20	2	0.13	0.17	2.18E-02
522	3	0.20	1.5	0.10	0.15	1.77E-02
523	3	0.20	1	0.07	0.13	1.40E-02
524	3	0.20	1.5	0.10	0.15	1.77E-02

PORE	MAX. DIA. (mm)	MAX. DIA. (μm)	MIN. DIA. (mm)	MIN. DIA. (μm)	AVE. DIA. (μm)	AREA (μm)(μm)
525	2	0.13	1	0.07	0.10	7.86E-03
526	2	0.13	1.5	0.10	0.12	1.07E-02
527	1.5	0.10	1.5	0.10	0.10	7.86E-03
528	1.5	0.10	1	0.07	0.08	5.46E-03
529	1.5	0.10	1.5	0.10	0.10	7.86E-03
530	2	0.13	0.5	0.03	0.08	5.46E-03
531	2	0.13	2	0.13	0.13	1.40E-02
532	3	0.20	1.5	0.10	0.15	1.77E-02
533	3	0.20	2	0.13	0.17	2.18E-02
534	3	0.20	1	0.07	0.13	1.40E-02
535	2.5	0.17	1.5	0.10	0.13	1.40E-02
536	2.5	0.17	1.5	0.10	0.13	1.40E-02
537	2.5	0.17	2	0.13	0.15	1.77E-02
538	2.5	0.17	0.5	0.03	0.10	7.86E-03
539	2.5	0.17	1	0.07	0.12	1.07E-02
540	2	0.13	0.5	0.03	0.08	5.46E-03
541	1.5	0.10	0.5	0.03	0.07	3.49E-03
542	2	0.13	1	0.07	0.10	7.86E-03
543	3	0.20	1	0.07	0.13	1.40E-02
544	2.5	0.17	2	0.13	0.15	1.77E-02
545	4	0.27	1.5	0.10	0.18	2.64E-02
546	3.5	0.23	1.5	0.10	0.17	2.18E-02
547	2.5	0.17	1	0.07	0.12	1.07E-02
548	2	0.13	2	0.13	0.13	1.40E-02
549	2	0.13	1	0.07	0.10	7.86E-03
550	2	0.13	1	0.07	0.10	7.86E-03
551	3	0.20	1	0.07	0.13	1.40E-02
552	2.5	0.17	0.5	0.03	0.10	7.86E-03
553	3	0.20	1.5	0.10	0.15	1.77E-02
554	2	0.13	2	0.13	0.13	1.40E-02
555	2	0.13	2	0.13	0.13	1.40E-02
556	2.5	0.17	2	0.13	0.15	1.77E-02
557	1	0.07	1	0.07	0.07	3.49E-03
558	2	0.13	2	0.13	0.13	1.40E-02
559	2.5	0.17	2	0.13	0.15	1.77E-02
560	3.5	0.23	1.5	0.10	0.17	2.18E-02
561	1	0.07	1	0.07	0.07	3.49E-03
562	3	0.20	2.5	0.17	0.18	2.64E-02
563	1	0.07	0.5	0.03	0.05	1.96E-03
564	0.5	0.03	0.5	0.03	0.03	8.73E-04
565	2	0.13	1.5	0.10	0.12	1.07E-02

PORE	MAX. DIA. (mm)	MAX. DIA. (µm)	MIN. DIA. (mm)	MIN. DIA. (µm)	AVE. DIA. (µm)	AREA (µm)(µm)
566	2	0.13	1.5	0.10	0.12	1.07E-02
567	1	0.07	1	0.07	0.07	3.49E-03
568	5	0.33	2	0.13	0.23	4.28E-02
569	4	0.27	1	0.07	0.17	2.18E-02
570	2	0.13	2	0.13	0.13	1.40E-02
571	1.5	0.10	1	0.07	0.08	5.46E-03
572	2	0.13	1	0.07	0.10	7.86E-03
573	2.5	0.17	1	0.07	0.12	1.07E-02
574	2.5	0.17	1.5	0.10	0.13	1.40E-02
575	4	0.27	2	0.13	0.20	3.14E-02
576	3	0.20	1.5	0.10	0.15	1.77E-02
577	2	0.13	1	0.07	0.10	7.86E-03
578	3	0.20	0.5	0.03	0.12	1.07E-02
579	3.5	0.23	2	0.13	0.18	2.64E-02
580	2.5	0.17	1.5	0.10	0.13	1.40E-02
581	2.5	0.17	1.5	0.10	0.13	1.40E-02
582	2	0.13	1.5	0.10	0.12	1.07E-02
583	3	0.20	2	0.13	0.17	2.18E-02
584	4	0.27	2	0.13	0.20	3.14E-02
585	2	0.13	1.5	0.10	0.12	1.07E-02
586	2	0.13	2	0.13	0.13	1.40E-02
587	1	0.07	1	0.07	0.07	3.49E-03
588	2	0.13	2	0.13	0.13	1.40E-02
589	3	0.20	2	0.13	0.17	2.18E-02
AVE.	2.327674	0.16	1.282513	0.09	0.12	8.02E+00
STD. DEV.		0.08		0.04		

APPENDIX D

Tables of number, maximum diameter, mininun diameter, average diameter, and plane surface area of pores for samples etched with helium at flow rate 25, 50, 75 and 100 mL/min, respectively. Four tables of data at each flow rate.

FLOW RATE:	25 ml/min
SAMPLE ID:	H1/a
S:	1
PHOTO NO.:	60
MAGNIFICATION	15,000
NO. OF PORES:	245

PORE	MAX. DIA. (mm)	MAX. DIA. (μm)	MIN. DIA. (mm)	MIN. DIA. (μm)	AVE. DIA. (μm)	AREA (μm)(μm)
1	3	0.20	2	0.13	0.17	2.18E-02
2	4	0.27	1	0.07	0.17	2.18E-02
3	1.5	0.10	1	0.07	0.08	5.45E-03
4	5.5	0.37	1	0.07	0.22	3.69E-02
5	5	0.33	3	0.20	0.27	5.59E-02
6	4.5	0.30	3	0.20	0.25	4.91E-02
7	4.5	0.30	2.5	0.17	0.23	4.28E-02
8	5.5	0.37	2	0.13	0.25	4.91E-02
9	6.5	0.43	4	0.27	0.35	9.62E-02
10	3	0.20	2.5	0.17	0.18	2.64E-02
11	6	0.40	1	0.07	0.23	4.28E-02
12	4	0.27	2.5	0.17	0.22	3.69E-02
13	4	0.27	1	0.07	0.17	2.18E-02
14	3	0.20	2	0.13	0.17	2.18E-02
15	4	0.27	2.5	0.17	0.22	3.69E-02
16	4	0.27	2.5	0.17	0.22	3.69E-02
17	5	0.33	1.5	0.10	0.22	3.69E-02
18	2	0.13	2	0.13	0.13	1.40E-02
19	3	0.20	2.5	0.17	0.18	2.64E-02
20	3	0.20	2	0.13	0.17	2.18E-02
21	3	0.20	2	0.13	0.17	2.18E-02
22	2	0.13	1	0.07	0.10	7.85E-03
23	3	0.20	1	0.07	0.13	1.40E-02
24	4	0.27	2.5	0.17	0.22	3.69E-02
25	16	1.07	7	0.47	0.77	4.62E-01
26	2	0.13	1.5	0.10	0.12	1.07E-02
27	6	0.40	1.5	0.10	0.25	4.91E-02
28	2	0.13	1.5	0.10	0.12	1.07E-02
29	4	0.27	3	0.20	0.23	4.28E-02
30	2	0.13	1.5	0.10	0.12	1.07E-02
31	7	0.47	3	0.20	0.33	8.73E-02
32	5.5	0.37	2	0.13	0.25	4.91E-02

PORE	MAX. DIA. (mm)	MAX. DIA. (μm)	MIN. DIA. (mm)	MIN. DIA. (μm)	AVE. DIA. (μm)	AREA (μm)(μm)
33	4	0.27	2	0.13	0.20	3.14E-02
34	4	0.27	2.5	0.17	0.22	3.69E-02
35	5	0.33	2.5	0.17	0.25	4.91E-02
36	3.5	0.23	1.5	0.10	0.17	2.18E-02
37	3	0.20	1.5	0.10	0.15	1.77E-02
38	3	0.20	2.5	0.17	0.18	2.64E-02
39	4.5	0.30	3	0.20	0.25	4.91E-02
40	3.5	0.23	2	0.13	0.18	2.64E-02
41	3	0.20	1.5	0.10	0.15	1.77E-02
42	4	0.27	2.5	0.17	0.22	3.69E-02
43	6	0.40	4	0.27	0.33	8.73E-02
44	11	0.73	1.5	0.10	0.42	1.36E-01
45	4.5	0.30	1.5	0.10	0.20	3.14E-02
46	2.5	0.17	2	0.13	0.15	1.77E-02
47	2	0.13	1.5	0.10	0.12	1.07E-02
48	4.5	0.30	1.5	0.10	0.20	3.14E-02
49	7	0.47	4	0.27	0.37	1.06E-0i
50	5.5	0.37	2	0.13	0.25	4.91E-02
51	2	0.13	1.5	0.10	0.12	1.07E-02
52	2	0.13	1.5	0.10	0.12	1.07E-02
53	2.5	0.17	1.5	0.10	0.13	1.40E-02
54	3	0.20	2	0.13	0.17	2.18E-02
55	5	0.33	3	0.20	0.27	5.59E-02
56	3.5	0.23	2.5	0.17	0.20	3.14E-02
57	2.5	0.17	2	0.13	0.15	1.77E-02
58	2	0.13	1.5	0.10	0.12	1.07E-02
59	6.5	0.43	3	0.20	0.32	7.88E-02
60	5	0.33	2	0.13	0.23	4.28E-02
61	4.5	0.30	3	0.20	0.25	4.91E-02
62	4	0.27	1.5	0.10	0.18	2.64E-02
63	2	0.13	2	0.13	0.13	1.40E-02
64	3.5	0.23	2.5	0.17	0.20	3.14E-02
65	5	0.33	2.5	0.17	0.25	4.91E-02
66	3	0.20	1.5	0.10	0.15	1.77E-02
67	3	0.20	1.5	0.10	0.15	1.77E-02
68	7.5	0.50	1.5	0.10	0.30	7.07E-02
69	4.5	0.30	1.5	0.10	0.20	3.14E-02
70	5	0.33	3	0.20	0.27	5.59E-02
71	3.5	0.23	2	0.13	0.18	2.64E-02
72	2	0.13	1	0.07	0.10	7.85E-03
73	3	0.20	1	0.07	0.13	1.40E-02

PORE	MAX. DIA. (mm)	MAX. DIA. (μm)	MIN. DIA. (mm)	MIN. DIA. (μm)	AVE. DIA. (μm)	AREA (μm)(μm)
74	5	0.33	2	0.13	0.23	4.28E-02
75	5	0.33	3	0.20	0.27	5.59E-02
76	4	0.27	1.5	0.10	0.18	2.64E-02
77	3	0.20	1	0.07	0.13	1.40E-02
78	3	0.20	2	0.13	0.17	2.18E-02
79	3	0.20	1.5	0.10	0.15	1.77E-02
80	3	0.20	2	0.13	0.17	2.18E-02
81	3	0.20	2.5	0.17	0.18	2.64E-02
82	5	0.33	3	0.20	0.27	5.59E-02
83	8	0.53	1	0.07	0.30	7.07E-02
84	4	0.27	2	0.13	0.20	3.14E-02
85	3	0.20	1	0.07	0.13	1.40E-02
86	3.5	0.23	1.5	0.10	0.17	2.18E-02
87	3	0.20	2	0.13	0.17	2.18E-02
88	3	0.20	2	0.13	0.17	2.18E-02
89	3.5	0.23	2.5	0.17	0.20	3.14E-02
90	3.5	0.23	2	0.13	0.18	2.64E-02
91	3	0.20	1.5	0.10	0.15	1.77E-02
92	3	0.20	2	0.13	0.17	2.18E-02
93	3	0.20	1	0.07	0.13	1.40E-02
94	3.5	0.23	1.5	0.10	0.17	2.18E-02
95	4	0.27	2.5	0.17	0.22	3.69E-02
96	5.5	0.37	2	0.13	0.25	4.91E-02
97	4.5	0.30	1.5	0.10	0.20	3.14E-02
98	5	0.33	1.5	0.10	0.22	3.69E-02
99	5.5	0.37	2.5	0.17	0.27	5.59E-02
100	7.5	0.50	2	0.13	0.32	7.88E-02
101	2.5	0.17	2	0.13	0.15	1.77E-02
102	2	0.13	1.5	0.10	0.12	1.07E-02
103	5.5	0.37	2	0.13	0.25	4.91E-02
104	2.5	0.17	1.5	0.10	0.13	1.40E-02
105	5.5	0.37	1.5	0.10	0.23	4.28E-02
106	2.5	0.17	1.5	0.10	0.13	1.40E-02
107	1	0.07	1	0.07	0.07	3.49E-03
108	5	0.33	1.5	0.10	0.22	3.69E-02
109	5	0.33	1	0.07	0.20	3.14E-02
110	2.5	0.17	2	0.13	0.15	1.77E-02
111	3	0.20	2	0.13	0.17	2.18E-02
112	3	0.20	2	0.13	0.17	2.18E-02
113	5.5	0.37	1.5	0.10	0.23	4.28E-02
114	2.5	0.17	1.5	0.10	0.13	1.40E-02

PORE	MAX. DIA. (mm)	MAX. DIA. (µm)	MIN. DIA. (mm)	MIN. DIA. (µm)	AVE. DIA. (µm)	AREA (µm)(µm)
115	2	0.13	1.5	0.10	0.12	1.07E-02
116	3	0.20	1.5	0.10	0.15	1.77E-02
117	3	0.20	1.5	0.10	0.15	1.77E-02
118	2.5	0.17	1.5	0.10	0.13	1.40E-02
119	3	0.20	2.5	0.17	0.18	2.64E-02
120	7.5	0.50	4	0.27	0.38	1.15E-01
121	6	0.40	2	0.13	0.27	5.59E-02
122	3	0.20	1.5	0.10	0.15	1.77E-02
123	3	0.20	2	0.13	0.17	2.18E-02
124	2	0.13	1.5	0.10	0.12	1.07E-02
125	2	0.13	1.5	0.10	0.12	1.07E-02
126	3	0.20	2	0.13	0.17	2.18E-02
127	4	0.27	2.5	0.17	0.22	3.69E-02
128	2.5	0.17	2	0.13	0.15	1.77E-02
129	2	0.13	2	0.13	0.13	1.40E-02
130	3	0.20	3	0.20	0.20	3.14E-02
131	3.5	0.23	3	0.20	0.22	3.69E-02
132	2.5	0.17	1.5	0.10	0.13	1.40E-02
133	2	0.13	1	0.07	0.10	7.85E-03
134	5	0.33	1	0.07	0.20	3.14E-02
135	7	0.47	1.5	0.10	0.28	6.31E-02
136	2	0.13	1	0.07	0.10	7.85E-03
137	2.5	0.17	2	0.13	0.15	1.77E-02
138	4.5	0.30	2	0.13	0.22	3.69E-02
139	2.5	0.17	2.5	0.17	0.17	2.18E-02
140	3	0.20	2	0.13	0.17	2.18E-02
141	4	0.27	2	0.13	0.20	3.14E-02
142	6	0.40	1.5	0.10	0.25	4.91E-02
143	5.5	0.37	3	0.20	0.28	6.31E-02
144	4	0.27	2.5	0.17	0.22	3.69E-02
145	4	0.27	1.5	0.10	0.18	2.64E-02
146	4	0.27	2	0.13	0.20	3.14E-02
147	4	0.27	1	0.07	0.17	2.18E-02
148	3.5	0.23	2	0.13	0.18	2.64E-02
149	4	0.27	2.5	0.17	0.22	3.69E-02
150	5.5	0.37	2.5	0.17	0.27	5.59E-02
151	3.5	0.23	2	0.13	0.18	2.64E-02
152	3	0.20	2	0.13	0.17	2.18E-02
153	3	0.20	2	0.13	0.17	2.18E-02
154	6.5	0.43	3.5	0.23	0.33	8.73E-02
155	2.5	0.17	2	0.13	0.15	1.77E-02

PORE	MAX. DIA. (mm)	MAX. DIA. (μm)	MIN. DIA. (mm)	MIN. DIA. (μm)	AVE. DIA. (μm)	AREA (μm)(μm)
156	3.5	0.23	2.5	0.17	0.20	3.14E-02
157	2.5	0.17	1.5	0.10	0.13	1.40E-02
158	2	0.13	2	0.13	0.13	1.40E-02
159	3	0.20	1	0.07	0.13	1.40E-02
160	3.5	0.23	2	0.13	0.18	2.64E-02
161	3	0.20	2.5	0.17	0.18	2.64E-02
162	4	0.27	2	0.13	0.20	3.14E-02
163	7	0.47	4	0.27	0.37	1.06E-01
164	3.5	0.23	2	0.13	0.18	2.64E-02
165	5	0.33	1.5	0.10	0.22	3.69E-02
166	5.5	0.37	2	0.13	0.25	4.91E-02
167	2	0.13	1.5	0.10	0.12	1.07E-02
168	5	0.33	2.5	0.17	0.25	4.91E-02
169	3	0.20	1.5	0.10	0.15	1.77E-02
170	2	0.13	2	0.13	0.13	1.40E-02
171	4.5	0.30	3	0.20	0.25	4.91E-02
172	3	0.20	2	0.13	0.17	2.18E-02
173	3	0.20	2	0.13	0.17	2.18E-02
174	3	0.20	1.5	0.10	0.15	1.77E-02
175	6	0.40	3.5	0.23	0.32	7.88E-02
176	8	0.53	3.5	0.23	0.38	1.15E-01
177	8	0.53	1.5	0.10	0.32	7.88E-02
178	3	0.20	1.5	0.10	0.15	1.77E-02
179	3	0.20	1.5	0.10	0.15	1.77E-02
180	3	0.20	2	0.13	0.17	2.18E-02
181	3	0.20	2	0.13	0.17	2.18E-02
182	5	0.33	2	0.13	0.23	4.28E-02
183	5	0.33	4	0.27	0.30	7.07E-02
184	3.5	0.23	1.5	0.10	0.17	2.18E-02
185	7	0.47	3	0.20	0.33	8.73E-02
186	6.5	0.43	3	0.20	0.32	7.88E-02
187	2	0.13	1.5	0.10	0.12	1.07E-02
188	2.5	0.17	2	0.13	0.15	1.77E-02
189	3	0.20	1.5	0.10	0.15	1.77E-02
190	8	0.53	2	0.13	0.33	8.73E-02
191	6	0.40	4	0.27	0.33	8.73E-02
192	4	0.27	2	0.13	0.20	3.14E-02
193	4	0.27	1.5	0.10	0.18	2.64E-02
194	4.5	0.30	1.5	0.10	0.20	3.14E-02
195	2	0.13	2	0.13	0.13	1.40E-02
196	3	0.20	2	0.13	0.17	2.18E-02

PORE	MAX. DIA. (mm)	MAX. DIA. (µm)	MIN. DIA. (mm)	MIN. DIA. (µm)	AVE. DIA. (µm)	AREA (µm)(µm)
197	3	0.20	2	0.13	0.17	2.18E-02
198	4	0.27	2	0.13	0.20	3.14E-02
199	3	0.20	2	0.13	0.17	2.18E-02
200	3	0.20	2.5	0.17	0.18	2.64E-02
201	5.5	0.37	2	0.13	0.25	4.91E-02
202	6	0.40	3	0.20	0.30	7.07E-02
203	5	0.33	3	0.20	0.27	5.59E-02
204	4.5	0.30	1	0.07	0.18	2.64E-02
205	3.5	0.23	2	0.13	0.18	2.64E-02
206	6	0.40	1.5	0.10	0.25	4.91E-02
207	2.5	0.17	1.5	0.10	0.13	1.40E-02
208	2	0.13	1.5	0.10	0.12	1.07E-02
209	3	0.20	1.5	0.10	0.15	1.77E-02
210	2.5	0.17	1.5	0.10	0.13	1.40E-02
211	2	0.13	1	0.07	0.10	7.85E-03
212	4	0.27	2.5	0.17	0.22	3.69E-02
213	3	0.20	2	0.13	0.17	2.18E-02
214	4	0.27	1.5	0.10	0.18	2.64E-02
215	4	0.27	3	0.20	0.23	4.28E-02
216	3	0.20	2	0.13	0.17	2.18E-02
217	3	0.20	1.5	0.10	0.15	1.77E-02
218	11.5	0.77	2.5	0.17	0.47	1.71E-01
219	3.5	0.23	2.5	0.17	0.20	3.14E-02
220	3	0.20	2	0.13	0.17	2.18E-02
221	3	0.20	2	0.13	0.17	2.18E-02
222	3	0.20	1.5	0.10	0.15	1.77E-02
223	6	0.40	2.5	0.17	0.28	6.31E-02
224	3	0.20	2.5	0.17	0.18	2.64E-02
225	4	0.27	1.5	0.10	0.18	2.64E-02
226	2	0.13	1	0.07	0.10	7.85E-03
227	7	0.47	1.5	0.10	0.28	6.31E-02
228	4	0.27	1.5	0.10	0.18	2.64E-02
229	8.5	0.57	1	0.07	0.32	7.88E-02
230	2.5	0.17	2	0.13	0.15	1.77E-02
231	2	0.13	2	0.13	0.13	1.40E-02
232	4.5	0.30	1.5	0.10	0.20	3.14E-02
233	4	0.27	2	0.13	0.20	3.14E-02
234	13	0.87	5.5	0.37	0.62	2.99E-01
235	3.5	0.23	1.5	0.10	0.17	2.18E-02
236	2.5	0.17	1.5	0.10	0.13	1.40E-02
237	4	0.27	2	0.13	0.20	3.14E-02

PORE	MAX. DIA. (mm)	MAX. DIA. (μm)	MIN. DIA. (mm)	MIN. DIA. (μm)	AVE. DIA. (μm)	AREA (μm)(μm)
238	5	0.33	2	0.13	0.23	4.28E-02
239	3	0.20	2	0.13	0.17	2.18E-02
240	2	0.13	1.5	0.10	0.12	1.07E-02
241	2.5	0.17	2	0.13	0.15	1.77E-02
242	3	0.20	1.5	0.10	0.15	1.77E-02
243	4	0.27	1	0.07	0.17	2.18E-02
244	5	0.33	2	0.13	0.23	4.28E-02
245	3	0.20	2	0.13	0.17	2.18E-02
AVE	3.983673	0.27	2.004082	0.13	0.20	8.87E+00
STD. DEV.		0.13		0.05		

FLOW RATE:	50 mL/min
SAMPLE ID:	H2/a
S:	1
PHOTO NO.:	68
MAGNIFICATION	15.0 K
NO. OF PORES:	361

PORE	MAX. DIA. (mm)	MAX. DIA. (µm)	MIN. DIA. (mm)	MIN. DIA. (µm)	AVE. DIA. (µm)	AREA (µm)(µm)
1	8	0.53	2.5	0.17	0.35	9.62E-02
2	4	0.27	2	0.13	0.20	3.14E-02
3	2	0.13	2	0.13	0.13	1.40E-02
4	4.5	0.30	2	0.13	0.22	3.69E-02
5	3.5	0.23	1.5	0.10	0.17	2.18E-02
6	3.5	0.23	2.5	0.17	0.20	3.14E-02
7	5	0.33	1	0.07	0.20	3.14E-02
8	2.5	0.17	1	0.07	0.12	1.07E-02
9	2.5	0.17	1.5	0.10	0.13	1.40E-02
10	2.5	0.17	2	0.13	0.15	1.77E-02
11	4.5	0.30	1	0.07	0.18	2.64E-02
12	3.5	0.23	1.5	0.10	0.17	2.18E-02
13	3	0.20	1.5	0.10	0.15	1.77E-02
14	2	0.13	1	0.07	0.10	7.86E-03
15	3	0.20	2	0.13	0.17	2.18E-02
16	6.5	0.43	1.5	0.10	0.27	5.59E-02
17	5	0.33	2	0.13	0.23	4.28E-02
18	3	0.20	1.5	0.10	0.15	1.77E-02
19	3	0.20	1.5	0.10	0.15	1.77E-02
20	4.5	0.30	1.5	0.10	0.20	3.14E-02
21	3	0.20	2.5	0.17	0.18	2.64E-02
22	4	0.27	1	0.07	0.17	2.18E-02
23	2.5	0.17	1.5	0.10	0.13	1.40E-02
24	6	0.40	2	0.13	0.27	5.59E-02
25	5	0.33	2	0.13	0.23	4.28E-02
26	5	0.33	1	0.07	0.20	3.14E-02
27	6	0.40	2	0.13	0.27	5.59E-02
28	7	0.47	1.5	0.10	0.28	6.31E-02
29	4	0.27	1.5	0.10	0.18	2.64E-02
30	6	0.40	1.5	0.10	0.25	4.91E-02
31	2.5	0.17	2	0.13	0.15	1.77E-02
32	5.5	0.37	4	0.27	0.32	7.88E-02

PORE	MAX. DIA. (mm)	MAX. DIA. (μm)	MIN. DIA. (mm)	MIN. DIA. (μm)	AVE. DIA. (μm)	AREA (μm)(μm)
33	3	0.20	2	0.13	0.17	2.18E-02
34	2.5	0.17	2	0.13	0.15	1.77E-02
35	6	0.40	2	0.13	0.27	5.59E-02
36	1	0.07	1	0.07	0.07	3.49E-03
37	4	0.27	1.5	0.10	0.18	2.64E-02
38	3	0.20	2	0.13	0.17	2.18E-02
39	3	0.20	2	0.13	0.17	2.18E-02
40	2	0.13	1	0.07	0.10	7.86E-03
41	6	0.40	1.5	0.10	0.25	4.91E-02
42	3.5	0.23	2	0.13	0.18	2.64E-02
43	3	0.20	2	0.13	0.17	2.18E-02
44	5	0.33	1.5	0.10	0.22	3.69E-02
45	6	0.40	1.5	0.10	0.25	4.91E-02
46	8	0.53	3	0.20	0.37	1.06E-01
47	8	0.53	3	0.20	0.37	1.06E-01
48	3	0.20	1.5	0.10	0.15	1.77E-02
49	7	0.47	2	0.13	0.30	7.07E-02
50	2.5	0.17	2.5	0.17	0.17	2.18E-02
51	3.5	0.23	2.5	0.17	0.20	3.14E-02
52	4	0.27	2.5	0.17	0.22	3.69E-02
53	3	0.20	2	0.13	0.17	2.18E-02
54	4	0.27	1.5	0.10	0.18	2.64E-02
55	6.5	0.43	1.5	0.10	0.27	5.59E-02
56	2	0.13	1.5	0.10	0.12	1.07E-02
57	10	0.67	1	0.07	0.37	1.06E-01
58	4	0.27	2	0.13	0.20	3.14E-02
59	6	0.40	1.5	0.10	0.25	4.91E-02
60	11	0.73	3	0.20	0.47	1.71E-01
61	4	0.27	1	0.07	0.17	2.18E-02
62	4	0.27	1	0.07	0.17	2.18E-02
63	8	0.53	3	0.20	0.37	1.06E-01
64	4	0.27	1	0.07	0.17	2.18E-02
65	4	0.27	1	0.07	0.17	2.18E-02
66	2.5	0.17	1.5	0.10	0.13	1.40E-02
67	4	0.27	2.5	0.17	0.22	3.69E-02
68	4	0.27	2	0.13	0.20	3.14E-02
69	7	0.47	4	0.27	0.37	1.06E-01
70	4	0.27	2	0.13	0.20	3.14E-02
71	10	0.67	4	0.27	0.47	1.71E-01
72	12.5	0.83	3	0.20	0.52	2.10E-01
73	4	0.27	2.5	0.17	0.22	3.69E-02

PORE	MAX. DIA. (mm)	MAX. DIA. (µm)	MIN. DIA. (mm)	MIN. DIA. (µm)	AVE. DIA. (µm)	AREA (µm)(µm)
74	3	0.20	2	0.13	0.17	2.18E-02
75	2	0.13	1	0.07	0.10	7.86E-03
76	5	0.33	3	0.20	0.27	5.59E-02
77	1.5	0.10	1.5	0.10	0.10	7.86E-03
78	1.5	0.10	1.5	0.10	0.10	7.86E-03
79	2.5	0.17	1.5	0.10	0.13	1.40E-02
80	4	0.27	4	0.27	0.27	5.59E-02
81	5	0.33	1.5	0.10	0.22	3.69E-02
82	4	0.27	1.5	0.10	0.18	2.64E-02
83	10	0.67	4	0.27	0.47	1.71E-01
84	7.5	0.50	3.5	0.23	0.37	1.06E-01
85	4	0.27	1	0.07	0.17	2.18E-02
86	3	0.20	1	0.07	0.13	1.40E-02
87	1.5	0.10	1	0.07	0.08	5.46E-03
88	9	0.60	5	0.33	0.47	1.71E-01
89	8	0.53	6	0.40	0.47	1.71E-01
90	4	0.27	3	0.20	0.23	4.28E-02
91	2	0.13	1	0.07	0.10	7.86E-03
92	1.5	0.10	1	0.07	0.08	5.46E-03
93	1.5	0.10	1.5	0.10	0.10	7.86E-03
94	2.5	0.17	2	0.13	0.15	1.77E-02
95	2	0.13	1	0.07	0.10	7.86E-03
96	2	0.13	2	0.13	0.13	1.40E-02
97	2	0.13	2	0.13	0.13	1.40E-02
98	5	0.33	1.5	0.10	0.22	3.69E-02
99	4	0.27	1.5	0.10	0.18	2.64E-02
100	2	0.13	1	0.07	0.10	7.86E-03
101	4	0.27	2	0.13	0.20	3.14E-02
102	4.5	0.30	1	0.07	0.18	2.64E-02
103	5	0.33	2.5	0.17	0.25	4.91E-02
104	3	0.20	1	0.07	0.13	1.40E-02
105	3	0.20	1.5	0.10	0.15	1.77E-02
106	5	0.33	2	0.13	0.23	4.28E-02
107	3	0.20	2.5	0.17	0.18	2.64E-02
108	1	0.07	1	0.07	0.07	3.49E-03
109	3	0.20	1.5	0.10	0.15	1.77E-02
110	4.5	0.30	1	0.07	0.18	2.64E-02
111	2	0.13	1.5	0.10	0.12	1.07E-02
112	2	0.13	1.5	0.10	0.12	1.07E-02
113	3.5	0.23	2	0.13	0.18	2.64E-02
114	2	0.13	1	0.07	0.10	7.86E-03

PORE	MAX. DIA. (mm)	MAX. DIA. (μm)	MIN. DIA. (mm)	MIN. DIA. (μm)	AVE. DIA. (μm)	AREA (μm)(μm)
115	3.5	0.23	2	0.13	0.18	2.64E-02
116	1.5	0.10	1.5	0.10	0.10	7.86E-03
117	2.5	0.17	1	0.07	0.12	1.07E-02
118	2.5	0.17	2.5	0.17	0.17	2.18E-02
119	3.5	0.23	2	0.13	0.18	2.64E-02
120	2.5	0.17	2	0.13	0.15	1.77E-02
121	2	0.13	1	0.07	0.10	7.86E-03
122	3	0.20	1	0.07	0.13	1.40E-02
123	2	0.13	2	0.13	0.13	1.40E-02
124	5	0.33	2	0.13	0.23	4.28E-02
125	4	0.27	3	0.20	0.23	4.28E-02
126	1.5	0.10	1	0.07	0.08	5.46E-03
127	1	0.07	0.5	0.03	0.05	1.96E-03
128	3	0.20	1	0.07	0.13	1.40E-02
129	3.5	0.23	2	0.13	0.18	2.64E-02
130	4	0.27	2	0.13	0.20	3.14E-02
131	5	0.33	1.5	0.10	0.22	3.69E-02
132	4	0.27	2	0.13	0.20	3.14E-02
133	2.5	0.17	1	0.07	0.12	1.07E-02
134	2	0.13	1	0.07	0.10	7.86E-03
135	2.5	0.17	1.5	0.10	0.13	1.40E-02
136	2.5	0.17	1.5	0.10	0.13	1.40E-02
137	3.5	0.23	1.5	0.10	0.17	2.18E-02
138	5	0.33	1.5	0.10	0.22	3.69E-02
139	2.5	0.17	2.5	0.17	0.17	2.18E-02
140	2	0.13	1	0.07	0.10	7.86E-03
141	5	0.33	2.5	0.17	0.25	4.91E-02
142	5	0.33	3	0.20	0.27	5.59E-02
143	6	0.40	2	0.13	0.27	5.59E-02
144	2	0.13	1	0.07	0.10	7.86E-03
145	3.5	0.23	2	0.13	0.18	2.64E-02
146	2	0.13	1	0.07	0.10	7.86E-03
147	9	0.60	4	0.27	0.43	1.48E-01
148	3	0.20	1	0.07	0.13	1.40E-02
149	1	0.07	1	0.07	0.07	3.49E-03
150	1.5	0.10	1	0.07	0.08	5.46E-03
151	3	0.20	1	0.07	0.13	1.40E-02
152	3.5	0.23	2	0.13	0.18	2.64E-02
153	7.5	0.50	6	0.40	0.45	1.59E-01
154	6.5	0.43	2.5	0.17	0.30	7.07E-02
155	2	0.13	1.5	0.10	0.12	1.07E-02

PORE	MAX. DIA. (mm)	MAX. DIA. (µm)	MIN. DIA. (mm)	MIN. DIA. (µm)	AVE. DIA. (µm)	AREA (µm)(µm)
156	2	0.13	1.5	0.10	0.12	1.07E-02
157	2	0.13	1.5	0.10	0.12	1.07E-02
158	3	0.20	1	0.07	0.13	1.40E-02
159	3	0.20	1	0.07	0.13	1.40E-02
160	1.5	0.10	1	0.07	0.08	5.46E-03
161	4	0.27	2	0.13	0.20	3.14E-02
162	7	0.47	6	0.40	0.43	1.48E-01
163	4	0.27	2.5	0.17	0.22	3.69E-02
164	4.5	0.30	2	0.13	0.22	3.69E-02
165	3	0.20	2	0.13	0.17	2.18E-02
166	2.5	0.17	2	0.13	0.15	1.77E-02
167	3	0.20	1.5	0.10	0.15	1.77E-02
168	3	0.20	1.5	0.10	0.15	1.77E-02
169	4	0.27	2	0.13	0.20	3.14E-02
170	6.5	0.43	4	0.27	0.35	9.62E-02
171	2.5	0.17	2	0.13	0.15	1.77E-02
172	2.5	0.17	1	0.07	0.12	1.07E-02
173	1.5	0.10	1	0.07	0.08	5.46E-03
174	1	0.07	0.5	0.03	0.05	1.96E-03
175	3.5	0.23	1	0.07	0.15	1.77E-02
176	2	0.13	1	0.07	0.10	7.86E-03
177	1.5	0.10	1.5	0.10	0.10	7.86E-03
178	3	0.20	2	0.13	0.17	2.18E-02
179	4	0.27	1	0.07	0.17	2.18E-02
180	1	0.07	1	0.07	0.07	3.49E-03
181	3	0.20	2	0.13	0.17	2.18E-02
182	2	0.13	1	0.07	0.10	7.86E-03
183	6	0.40	3.5	0.23	0.32	7.88E-02
184	2	0.13	1	0.07	0.10	7.86E-03
185	3	0.20	1	0.07	0.13	1.40E-02
186	1.5	0.10	1	0.07	0.08	5.46E-03
187	3	0.20	2	0.13	0.17	2.18E-02
188	3	0.20	2	0.13	0.17	2.18E-02
189	2	0.13	2	0.13	0.13	1.40E-02
190	3	0.20	2	0.13	0.17	2.18E-02
191	3	0.20	2	0.13	0.17	2.18E-02
192	5	0.33	1.5	0.10	0.22	3.69E-02
193	2	0.13	1	0.07	0.10	7.86E-03
194	1	0.07	1	0.07	0.07	3.49E-03
195	1.5	0.10	1	0.07	0.08	5.46E-03
196	1.5	0.10	1	0.07	0.08	5.46E-03

PORE	MAX. DIA. (mm)	MAX. DIA. (µm)	MIN. DIA. (mm)	MIN. DIA. (µm)	AVE. DIA. (µm)	AREA (µm)(µm)
197	1.5	0.10	1.5	0.10	0.10	7.86E-03
198	1.5	0.10	1.5	0.10	0.10	7.86E-03
199	2	0.13	2	0.13	0.13	1.40E-02
200	4	0.27	2	0.13	0.20	3.14E-02
201	4	0.27	1.5	0.10	0.18	2.64E-02
202	2	0.13	1.5	0.10	0.12	1.07E-02
203	1	0.07	1	0.07	0.07	3.49E-03
204	2	0.13	1	0.07	0.10	7.86E-03
205	1.5	0.10	1	0.07	0.08	5.46E-03
206	2	0.13	1	0.07	0.10	7.86E-03
207	3	0.20	2	0.13	0.17	2.18E-02
208	3	0.20	2	0.13	0.17	2.18E-02
209	3	0.20	1.5	0.10	0.15	1.77E-02
210	2.5	0.17	1.5	0.10	0.13	1.40E-02
211	5.5	0.37	3	0.20	0.28	6.31E-02
212	4	0.27	3	0.20	0.23	4.28E-02
213	3	0.20	1	0.07	0.13	1.40E-02
214	3	0.20	1.5	0.10	0.15	1.77E-02
215	2	0.13	1	0.07	0.10	7.86E-03
216	3.5	0.23	1	0.07	0.15	1.77E-02
217	3.5	0.23	2	0.13	0.18	2.64E-02
218	6	0.40	2.5	0.17	0.28	6.31E-02
219	2	0.13	1	0.07	0.10	7.86E-03
220	5	0.33	1	0.07	0.20	3.14E-02
221	2.5	0.17	1	0.07	0.12	1.07E-02
222	3	0.20	1.5	0.10	0.15	1.77E-02
223	4	0.27	1.5	0.10	0.18	2.64E-02
224	5	0.33	1.5	0.10	0.22	3.69E-02
225	2	0.13	1	0.07	0.10	7.86E-03
226	5	0.33	2.5	0.17	0.25	4.91E-02
227	5	0.33	2	0.13	0.23	4.28E-02
228	5	0.33	1.5	0.10	0.22	3.69E-02
229	4	0.27	1.5	0.10	0.18	2.64E-02
230	3	0.20	1.5	0.10	0.15	1.77E-02
231	3	0.20	1.5	0.10	0.15	1.77E-02
232	4	0.27	2	0.13	0.20	3.14E-02
233	2.5	0.17	2	0.13	0.15	1.77E-02
234	3	0.20	1.5	0.10	0.15	1.77E-02
235	5	0.33	4	0.27	0.30	7.07E-02
236	5.5	0.37	1.5	0.10	0.23	4.28E-02
237	3	0.20	1.5	0.10	0.15	1.77E-02

PORE	MAX. DIA. (mm)	MAX. DIA. (μm)	MIN. DIA. (mm)	MIN. DIA. (μm)	AVE. DIA. (μm)	AREA (μm)(μm)
238	5	0.33	2	0.13	0.23	4.28E-02
239	2	0.13	1.5	0.10	0.12	1.07E-02
240	6	0.40	1	0.07	0.23	4.28E-02
241	5.5	0.37	3.5	0.23	0.30	7.07E-02
242	3	0.20	1	0.07	0.13	1.40E-02
243	3	0.20	1.5	0.10	0.15	1.77E-02
244	1.5	0.10	1	0.07	0.08	5.46E-03
245	2	0.13	1	0.07	0.10	7.86E-03
246	3	0.20	1	0.07	0.13	1.40E-02
247	2	0.13	1	0.07	0.10	7.86E-03
248	5	0.33	4	0.27	0.30	7.07E-02
249	2.5	0.17	1.5	0.10	0.13	1.40E-02
250	4	0.27	1.5	0.10	0.18	2.64E-02
251	4	0.27	1.5	0.10	0.18	2.64E-02
252	5	0.33	1.5	0.10	0.22	3.69E-02
253	3	0.20	1.5	0.10	0.15	1.77E-02
254	2	0.13	1	0.07	0.10	7.86E-03
255	2	0.13	1.5	0.10	0.12	1.07E-02
256	6	0.40	2.5	0.17	0.28	6.31E-02
257	2	0.13	1.5	0.10	0.12	1.07E-02
258	1	0.07	1	0.07	0.07	3.49E-03
259	1.5	0.10	1	0.07	0.08	5.46E-03
260	3	0.20	1	0.07	0.13	1.40E-02
261	2.5	0.17	1	0.07	0.12	1.07E-02
262	3	0.20	1.5	0.10	0.15	1.77E-02
263	2	0.13	1	0.07	0.10	7.86E-03
264	6	0.40	2	0.13	0.27	5.59E-02
265	5	0.33	2	0.13	0.23	4.28E-02
266	8	0.53	2	0.13	0.33	8.73E-02
267	2.5	0.17	1.5	0.10	0.13	1.40E-02
268	2.5	0.17	1.5	0.10	0.13	1.40E-02
269	6	0.40	3	0.20	0.30	7.07E-02
270	5	0.33	3	0.20	0.27	5.59E-02
271	5	0.33	2	0.13	0.23	4.28E-02
272	5	0.33	1	0.07	0.20	3.14E-02
273	4	0.27	1.5	0.10	0.18	2.64E-02
274	3.5	0.23	1.5	0.10	0.17	2.18E-02
275	4	0.27	3	0.20	0.23	4.28E-02
276	6	0.40	1	0.07	0.23	4.28E-02
277	4	0.27	1.5	0.10	0.18	2.64E-02
278	2.5	0.17	2	0.13	0.15	1.77E-02

PORE	MAX. DIA. (mm)	MAX. DIA. (μm)	MIN. DIA. (mm)	MIN. DIA. (μm)	AVE. DIA. (μm)	AREA (μm)(μm)
279	4	0.27	2	0.13	0.20	3.14E-02
280	5	0.33	3	0.20	0.27	5.59E-02
281	6	0.40	1	0.07	0.23	4.28E-02
282	8	0.53	1	0.07	0.30	7.07E-02
283	2	0.13	2	0.13	0.13	1.40E-02
284	2	0.13	1	0.07	0.10	7.86E-03
285	4	0.27	1.5	0.10	0.18	2.64E-02
286	3	0.20	2	0.13	0.17	2.18E-02
287	9	0.60	4.5	0.30	0.45	1.59E-01
288	4	0.27	4	0.27	0.27	5.59E-02
289	3	0.20	1.5	0.10	0.15	1.77E-02
290	2	0.13	1	0.07	0.10	7.86E-03
291	3	0.20	1	0.07	0.13	1.40E-02
292	2	0.13	2	0.13	0.13	1.40E-02
293	2.5	0.17	2	0.13	0.15	1.77E-02
294	2.5	0.17	2	0.13	0.15	1.77E-02
295	3	0.20	2	0.13	0.17	2.18E-02
296	5.5	0.37	2	0.13	0.25	4.91E-02
297	5	0.33	2.5	0.17	0.25	4.91E-02
298	5	0.33	2	0.13	0.23	4.28E-02
299	4	0.27	2	0.13	0.20	3.14E-02
300	5	0.33	2	0.13	0.23	4.28E-02
301	4	0.27	2	0.13	0.20	3.14E-02
302	3	0.20	2	0.13	0.17	2.18E-02
303	4	0.27	1	0.07	0.17	2.18E-02
304	5	0.33	1	0.07	0.20	3.14E-02
305	3	0.20	1.5	0.10	0.15	1.77E-02
306	7.5	0.50	2	0.13	0.32	7.88E-02
307	6	0.40	1.5	0.10	0.25	4.91E-02
308	3.5	0.23	1	0.07	0.15	1.77E-02
309	5	0.33	1.5	0.10	0.22	3.69E-02
310	7.5	0.50	2	0.13	0.32	7.88E-02
311	7	0.47	5	0.33	0.40	1.26E-01
312	2	0.13	1	0.07	0.10	7.86E-03
313	1	0.07	1	0.07	0.07	3.49E-03
314	3	0.20	2.5	0.17	0.18	2.64E-02
315	4	0.27	2	0.13	0.20	3.14E-02
316	4	0.27	2.5	0.17	0.22	3.69E-02
317	2.5	0.17	1.5	0.10	0.13	1.40E-02
318	2.5	0.17	1.5	0.10	0.13	1.40E-02
319	5	0.33	1.5	0.10	0.22	3.69E-02

PORE	MAX. DIA. (mm)	MAX. DIA. (μm)	MIN. DIA. (mm)	MIN. DIA. (μm)	AVE. DIA. (μm)	AREA (μm)(μm)
320	4	0.27	2	0.13	0.20	3.14E-02
321	4.5	0.30	1.5	0.10	0.20	3.14E-02
322	3	0.20	1.5	0.10	0.15	1.77E-02
323	2	0.13	2	0.13	0.13	1.40E-02
324	2	0.13	2	0.13	0.13	1.40E-02
325	2	0.13	1	0.07	0.10	7.86E-03
326	2.5	0.17	1.5	0.10	0.13	1.40E-02
327	3	0.20	2	0.13	0.17	2.18E-02
328	2.5	0.17	1.5	0.10	0.13	1.40E-02
329	3	0.20	2	0.13	0.17	2.18E-02
330	3	0.20	2	0.13	0.17	2.18E-02
331	3	0.20	1	0.07	0.13	1.40E-02
332	2	0.13	1.5	0.10	0.12	1.07E-02
333	2.5	0.17	1	0.07	0.12	1.07E-02
334	2.5	0.17	1	0.07	0.12	1.07E-02
335	2	0.13	1	0.07	0.10	7.86E-03
336	3	0.20	1.5	0.10	0.15	1.77E-02
337	5	0.33	2	0.13	0.23	4.28E-02
338	1.5	0.10	1	0.07	0.08	5.46E-03
339	1.5	0.10	1	0.07	0.08	5.46E-03
340	2	0.13	1	0.07	0.10	7.86E-03
341	3	0.20	1.5	0.10	0.15	1.77E-02
342	1.5	0.10	1	0.07	0.08	5.46E-03
343	2	0.13	1	0.07	0.10	7.86E-03
344	2.5	0.17	1	0.07	0.12	1.07E-02
345	3	0.20	1.5	0.10	0.15	1.77E-02
346	4	0.27	1.5	0.10	0.18	2.64E-02
347	5	0.33	4	0.27	0.30	7.07E-02
348	4	0.27	3.5	0.23	0.25	4.91E-02
349	4	0.27	1.5	0.10	0.18	2.64E-02
350	1.5	0.10	1	0.07	0.08	5.46E-03
351	2.5	0.17	1.5	0.10	0.13	1.40E-02
352	2.5	0.17	1.5	0.10	0.13	1.40E-02
353	2	0.13	1	0.07	0.10	7.86E-03
354	2	0.13	2	0.13	0.13	1.40E-02
355	3	0.20	2	0.13	0.17	2.18E-02
356	5	0.33	1.5	0.10	0.22	3.69E-02
357	4	0.27	1	0.07	0.17	2.18E-02
358	4	0.27	2	0.13	0.20	3.14E-02
359	3	0.20	2	0.13	0.17	2.18E-02
360	2	0.13	2	0.13	0.13	1.40E-02

PORE	MAX. DIA. (mm)	MAX. DIA. (μm)	MIN. DIA. (mm)	MIN. DIA. (μm)	AVE. DIA. (μm)	AREA (μm)(μm)
361	1.5	0.10	1	0.07	0.08	5.46E-03
AVE	3.62	0.24	1.76	0.12	0.18	1.10E+01
STD. VEV.		0.12		0.06		

FLOW RATE:	75 mL/min
SAMPLE ID:	H3/d
S:	1
PHOTO NO.:	72
MAGNIFICATION	15.0 K
NO. OF PORES:	514

PORE	MAX. DIA. (mm)	MAX. DIA. (Um)	MIN. DIA. (mm)	MIN. DIA. (Um)	AVE. DIA. (Um)	AREA
1	1.5	0.10	1.5	0.10	0.10	7.86E-03
2	1.5	0.10	1	0.07	0.08	5.46E-03
3	2	0.13	1.5	0.10	0.12	1.07E-02
4	2	0.13	1	0.07	0.10	7.86E-03
5	1.5	0.10	1	0.07	0.08	5.46E-03
6	3	0.20	1	0.07	0.13	1.40E-02
7	3.5	0.23	1.5	0.10	0.17	2.18E-02
8	5	0.33	3	0.20	0.27	5.59E-02
9	4	0.27	1.5	0.10	0.18	2.64E-02
10	1.5	0.10	1	0.07	0.08	5.46E-03
11	4	0.27	1.5	0.10	0.18	2.64E-02
12	4	0.27	2	0.13	0.20	3.14E-02
13	4	0.27	1.5	0.10	0.18	2.64E-02
14	2	0.13	1.5	0.10	0.12	1.07E-02
15	2	0.13	1	0.07	0.10	7.86E-03
16	1.5	0.10	1.5	0.10	0.10	7.86E-03
17	2	0.13	1.5	0.10	0.12	1.07E-02
18	4	0.27	2	0.13	0.20	3.14E-02
19	3	0.20	1.5	0.10	0.15	1.77E-02
20	6	0.40	2	0.13	0.27	5.59E-02
21	2	0.13	1.5	0.10	0.12	1.07E-02
22	2	0.13	1.5	0.10	0.12	1.07E-02
23	2	0.13	1.5	0.10	0.12	1.07E-02
24	3	0.20	1.5	0.10	0.15	1.77E-02
25	4	0.27	1.5	0.10	0.18	2.64E-02
26	1.5	0.10	1.5	0.10	0.10	7.86E-03
27	1.5	0.10	1.5	0.10	0.10	7.86E-03
28	1	0.07	1	0.07	0.07	3.49E-03
29	5	0.33	4	0.27	0.30	7.07E-02
30	1	0.07	0.5	0.03	0.05	1.96E-03
31	1	0.07	1	0.07	0.07	3.49E-03
32	4	0.27	2	0.13	0.20	3.14E-02

PORE	MAX. DIA. (mm)	MAX. DIA. (Um)	MIN. DIA. (mm)	MIN. DIA. (Um)	AVE. DIA. (Um)	AREA
33	3.5	0.23	2.5	0.17	0.20	3.14E-02
34	1.5	0.10	1	0.07	0.08	5.46E-03
35	1.5	0.10	1	0.07	0.08	5.46E-03
36	2	0.13	1	0.07	0.10	7.86E-03
37	5	0.33	1	0.07	0.20	3.14E-02
38	2.5	0.17	1	0.07	0.12	1.07E-02
39	2.5	0.17	1.5	0.10	0.13	1.40E-02
40	2	0.13	1.5	0.10	0.12	1.07E-02
41	3	0.20	1.5	0.10	0.15	1.77E-02
42	1.5	0.10	1	0.07	0.08	5.46E-03
43	2	0.13	2	0.13	0.13	1.40E-02
44	2.5	0.17	2	0.13	0.15	1.77E-02
45	2	0.13	1	0.07	0.10	7.86E-03
46	4	0.27	1.5	0.10	0.18	2.64E-02
47	3	0.20	1.5	0.10	0.15	1.77E-02
48	4.5	0.30	2	0.13	0.22	3.69E-02
49	3.5	0.23	1.5	0.10	0.17	2.18E-02
50	3.5	0.23	1.5	0.10	0.17	2.18E-02
51	2.5	0.17	2.5	0.17	0.17	2.18E-02
52	5	0.33	1.5	0.10	0.22	3.69E-02
53	3	0.20	2	0.13	0.17	2.18E-02
54	3	0.20	1.5	0.10	0.15	1.77E-02
55	2	0.13	2	0.13	0.13	1.40E-02
56	5	0.33	2	0.13	0.23	4.28E-02
57	2.5	0.17	1.5	0.10	0.13	1.40E-02
58	3.5	0.23	1.5	0.10	0.17	2.18E-02
59	2	0.13	2	0.13	0.13	1.40E-02
60	2	0.13	1.5	0.10	0.12	1.07E-02
61	2	0.13	1.5	0.10	0.12	1.07E-02
62	2	0.13	1	0.07	0.10	7.86E-03
63	4	0.27	2	0.13	0.20	3.14E-02
64	2	0.13	1	0.07	0.10	7.86E-03
65	2	0.13	1	0.07	0.10	7.86E-03
66	2	0.13	1.5	0.10	0.12	1.07E-02
67	5.5	0.37	3.5	0.23	0.30	7.07E-02
68	3	0.20	1.5	0.10	0.15	1.77E-02
69	3	0.20	2	0.13	0.17	2.18E-02
70	2	0.13	2	0.13	0.13	1.40E-02
71	3	0.20	2.5	0.17	0.18	2.64E-02
72	3	0.20	2	0.13	0.17	2.18E-02
73	6	0.40	2	0.13	0.27	5.59E-02

PORE	MAX. DIA. (mm)	MAX. DIA. (Um)	MIN. DIA. (mm)	MIN. DIA. (Um)	AVE. DIA. (Um)	AREA
74	2.5	0.17	2	0.13	0.15	1.77E-02
75	2	0.13	2	0.13	0.13	1.40E-02
76	3	0.20	2	0.13	0.17	2.18E-02
77	3	0.20	2	0.13	0.17	2.18E-02
78	3	0.20	2	0.13	0.17	2.18E-02
79	3	0.20	2	0.13	0.17	2.18E-02
80	2.5	0.17	2	0.13	0.15	1.77E-02
81	2.5	0.17	2	0.13	0.15	1.77E-02
82	3	0.20	1.5	0.10	0.15	1.77E-02
83	5	0.33	1	0.07	0.20	3.14E-02
84	4	0.27	2	0.13	0.20	3.14E-02
85	2.5	0.17	2	0.13	0.15	1.77E-02
86	2	0.13	1	0.07	0.10	7.86E-03
87	5	0.33	2	0.13	0.23	4.28E-02
88	4	0.27	1.5	0.10	0.18	2.64E-02
89	7.5	0.50	1.5	0.10	0.30	7.07E-02
90	3	0.20	2.5	0.17	0.18	2.64E-02
91	3.5	0.23	2	0.13	0.18	2.64E-02
92	3	0.20	1.5	0.10	0.15	1.77E-02
93	6	0.40	2.5	0.17	0.28	6.31E-02
94	5	0.33	1	0.07	0.20	3.14E-02
95	3	0.20	2	0.13	0.17	2.18E-02
96	2	0.13	2	0.13	0.13	1.40E-02
97	2.5	0.17	1.5	0.10	0.13	1.40E-02
98	3.5	0.23	1.5	0.10	0.17	2.18E-02
99	4	0.27	2	0.13	0.20	3.14E-02
100	5	0.33	1.5	0.10	0.22	3.69E-02
101	5	0.33	2	0.13	0.23	4.28E-02
102	2.5	0.17	1	0.07	0.12	1.07E-02
103	3	0.20	2	0.13	0.17	2.18E-02
104	3	0.20	1.5	0.10	0.15	1.77E-02
105	1.5	0.10	1	0.07	0.08	5.46E-03
106	3.5	0.23	1	0.07	0.15	1.77E-02
107	5	0.33	2	0.13	0.23	4.28E-02
108	5	0.33	2	0.13	0.23	4.28E-02
109	3	0.20	1.5	0.10	0.15	1.77E-02
110	4	0.27	1	0.07	0.17	2.18E-02
111	2.5	0.17	1.5	0.10	0.13	1.40E-02
112	3	0.20	2	0.13	0.17	2.18E-02
113	2	0.13	2	0.13	0.13	1.40E-02
114	3	0.20	2.5	0.17	0.18	2.64E-02

PORE	MAX. DIA. (mm)	MAX. DIA. (Um)	MIN. DIA. (mm)	MIN. DIA. (Um)	AVE. DIA. (Um)	AREA
115	3	0.20	1	0.07	0.13	1.40E-02
116	4	0.27	3.5	0.23	0.25	4.91E-02
117	4	0.27	1.5	0.10	0.18	2.64E-02
118	3	0.20	2	0.13	0.17	2.18E-02
119	2.5	0.17	1	0.07	0.12	1.07E-02
120	2	0.13	1	0.07	0.10	7.86E-03
121	3.5	0.23	1.5	0.10	0.17	2.18E-02
122	2.5	0.17	1.5	0.10	0.13	1.40E-02
123	1.5	0.10	1.5	0.10	0.10	7.86E-03
124	3	0.20	1.5	0.10	0.15	1.77E-02
125	2.5	0.17	2	0.13	0.15	1.77E-02
126	2.5	0.17	1.5	0.10	0.13	1.40E-02
127	2.5	0.17	1.5	0.10	0.13	1.40E-02
128	3	0.20	1.5	0.10	0.15	1.77E-02
129	2.5	0.17	2.5	0.17	0.17	2.18E-02
130	2	0.13	1	0.07	0.10	7.86E-03
131	6	0.40	2.5	0.17	0.28	6.31E-02
132	6	0.40	2	0.13	0.27	5.59E-02
133	2.5	0.17	1.5	0.10	0.13	1.40E-02
134	2	0.13	1	0.07	0.10	7.86E-03
135	1.5	0.10	1.5	0.10	0.10	7.86E-03
136	2.5	0.17	1	0.07	0.12	1.07E-02
137	2	0.13	1.5	0.10	0.12	1.07E-02
138	2.5	0.17	2	0.13	0.15	1.77E-02
139	10	0.67	2	0.13	0.40	1.26E-01
140	5.5	0.37	1.5	0.10	0.23	4.28E-02
141	3	0.20	1.5	0.10	0.15	1.77E-02
142	2	0.13	1	0.07	0.10	7.86E-03
143	4	0.27	2	0.13	0.20	3.14E-02
144	2	0.13	1.5	0.10	0.12	1.07E-02
145	3	0.20	1.5	0.10	0.15	1.77E-02
146	4	0.27	1.5	0.10	0.18	2.64E-02
147	2.5	0.17	1	0.07	0.12	1.07E-02
148	2.5	0.17	1.5	0.10	0.13	1.40E-02
149	3.5	0.23	1	0.07	0.15	1.77E-02
150	2	0.13	2	0.13	0.13	1.40E-02
151	4	0.27	2	0.13	0.20	3.14E-02
152	3	0.20	1.5	0.10	0.15	1.77E-02
153	5	0.33	1	0.07	0.20	3.14E-02
154	2.5	0.17	2.5	0.17	0.17	2.18E-02
155	2	0.13	1	0.07	0.10	7.86E-03

PORE	MAX. DIA. (mm)	MAX. DIA. (Um)	MIN. DIA. (mm)	MIN. DIA. (Um)	AVE. DIA. (Um)	AREA
156	3.5	0.23	1.5	0.10	0.17	2.18E-02
157	3.5	0.23	1	0.07	0.15	1.77E-02
158	5	0.33	1.5	0.10	0.22	3.69E-02
159	4	0.27	1.5	0.10	0.18	2.64E-02
160	3.5	0.23	1	0.07	0.15	1.77E-02
161	4	0.27	1.5	0.10	0.18	2.64E-02
162	1.5	0.10	1.5	0.10	0.10	7.86E-03
163	3	0.20	2	0.13	0.17	2.18E-02
164	2	0.13	1.5	0.10	0.12	1.07E-02
165	3	0.20	2	0.13	0.17	2.18E-02
166	3	0.20	2	0.13	0.17	2.18E-02
167	2	0.13	1	0.07	0.10	7.86E-03
168	1	0.07	1	0.07	0.07	3.49E-03
169	4	0.27	1.5	0.10	0.18	2.64E-02
170	1.5	0.10	1.5	0.10	0.10	7.86E-03
171	2	0.13	2	0.13	0.13	1.40E-02
172	2.5	0.17	2	0.13	0.15	1.77E-02
173	5	0.33	1.5	0.10	0.22	3.69E-02
174	5	0.33	2	0.13	0.23	4.28E-02
175	4.5	0.30	1.5	0.10	0.20	3.14E-02
176	2	0.13	1.5	0.10	0.12	1.07E-02
177	2	0.13	1	0.07	0.10	7.86E-03
178	4	0.27	3	0.20	0.23	4.28E-02
179	4	0.27	2.5	0.17	0.22	3.69E-02
180	3	0.20	1	0.07	0.13	1.40E-02
181	2.5	0.17	2	0.13	0.15	1.77E-02
182	2.5	0.17	1.5	0.10	0.13	1.40E-02
183	3.5	0.23	2	0.13	0.18	2.64E-02
184	4	0.27	3.5	0.23	0.25	4.91E-02
185	4	0.27	2	0.13	0.20	3.14E-02
186	2	0.13	1.5	0.10	0.12	1.07E-02
187	3	0.20	1.5	0.10	0.15	1.77E-02
188	3	0.20	2	0.13	0.17	2.18E-02
189	1.5	0.10	1	0.07	0.08	5.46E-03
190	3	0.20	1.5	0.10	0.15	1.77E-02
191	3	0.20	1	0.07	0.13	1.40E-02
192	3	0.20	2	0.13	0.17	2.18E-02
193	2	0.13	2	0.13	0.13	1.40E-02
194	5	0.33	2	0.13	0.23	4.28E-02
195	2	0.13	1.5	0.10	0.12	1.07E-02
196	2	0.13	1	0.07	0.10	7.86E-03

PORE	MAX. DIA. (mm)	MAX. DIA. (Um)	MIN. DIA. (mm)	MIN. DIA. (Um)	AVE. DIA. (Um)	AREA
197	2	0.13	2	0.13	0.13	1.40E-02
198	2.5	0.17	1.5	0.10	0.13	1.40E-02
199	2	0.13	2	0.13	0.13	1.40E-02
200	3	0.20	2	0.13	0.17	2.18E-02
201	3	0.20	2.5	0.17	0.18	2.64E-02
202	3	0.20	2.5	0.17	0.18	2.64E-02
203	2.5	0.17	1.5	0.10	0.13	1.40E-02
204	3	0.20	2	0.13	0.17	2.18E-02
205	5	0.33	2	0.13	0.23	4.28E-02
206	4.5	0.30	1.5	0.10	0.20	3.14E-02
207	4	0.27	1	0.07	0.17	2.18E-02
208	2.5	0.17	1	0.07	0.12	1.07E-02
209	2	0.13	1.5	0.10	0.12	1.07E-02
210	2	0.13	1	0.07	0.10	7.86E-03
211	3	0.20	1.5	0.10	0.15	1.77E-02
212	2.5	0.17	1	0.07	0.12	1.07E-02
213	1.5	0.10	1	0.07	0.08	5.46E-03
214	2	0.13	1	0.07	0.10	7.86E-03
215	2	0.13	1.5	0.10	0.12	1.07E-02
216	2.5	0.17	1.5	0.10	0.13	1.40E-02
217	3	0.20	1.5	0.10	0.15	1.77E-02
218	4	0.27	1	0.07	0.17	2.18E-02
219	2.5	0.17	1.5	0.10	0.13	1.40E-02
220	2	0.13	1	0.07	0.10	7.86E-03
221	4	0.27	2	0.13	0.20	3.14E-02
222	1.5	0.10	1.5	0.10	0.10	7.86E-03
223	1	0.07	1	0.07	0.07	3.49E-03
224	3.5	0.23	1.5	0.10	0.17	2.18E-02
225	4	0.27	1.5	0.10	0.18	2.64E-02
226	3	0.20	1.5	0.10	0.15	1.77E-02
227	4	0.27	2	0.13	0.20	3.14E-02
228	4	0.27	3	0.20	0.23	4.28E-02
229	5	0.33	2.5	0.17	0.25	4.91E-02
230	2.5	0.17	1.5	0.10	0.13	1.40E-02
231	5	0.33	2	0.13	0.23	4.28E-02
232	3	0.20	1.5	0.10	0.15	1.77E-02
233	4	0.27	2.5	0.17	0.22	3.69E-02
234	3.5	0.23	1	0.07	0.15	1.77E-02
235	2	0.13	1	0.07	0.10	7.86E-03
236	1.5	0.10	1	0.07	0.08	5.46E-03
237	1.5	0.10	1.5	0.10	0.10	7.86E-03

PORE	MAX. DIA. (mm)	MAX. DIA. (Um)	MIN. DIA. (mm)	MIN. DIA. (Um)	AVE. DIA. (Um)	AREA
238	2.5	0.17	2	0.13	0.15	1.77E-02
239	3	0.20	1.5	0.10	0.15	1.77E-02
240	1.5	0.10	1.5	0.10	0.10	7.86E-03
241	5	0.33	2	0.13	0.23	4.28E-02
242	2	0.13	2	0.13	0.13	1.40E-02
243	2	0.13	1	0.07	0.10	7.86E-03
244	3.5	0.23	1	0.07	0.15	1.77E-02
245	1.5	0.10	1.5	0.10	0.10	7.86E-03
246	3	0.20	1.5	0.10	0.15	1.77E-02
247	3	0.20	2.5	0.17	0.18	2.64E-02
248	2.5	0.17	2.5	0.17	0.17	2.18E-02
249	2.5	0.17	1	0.07	0.12	1.07E-02
250	3	0.20	1	0.07	0.13	1.40E-02
251	1.5	0.10	1.5	0.10	0.10	7.86E-03
252	3	0.20	2	0.13	0.17	2.18E-02
253	2	0.13	1.5	0.10	0.12	1.07E-02
254	3	0.20	1.5	0.10	0.15	1.77E-02
255	3	0.20	1	0.07	0.13	1.40E-02
256	2	0.13	1	0.07	0.10	7.86E-03
257	2	0.13	1.5	0.10	0.12	1.07E-02
258	3	0.20	1.5	0.10	0.15	1.77E-02
259	3	0.20	2.5	0.17	0.18	2.64E-02
260	2	0.13	2	0.13	0.13	1.40E-02
261	3	0.20	1.5	0.10	0.15	1.77E-02
262	2.5	0.17	1	0.07	0.12	1.07E-02
263	3	0.20	2	0.13	0.17	2.18E-02
264	1.5	0.10	1.5	0.10	0.10	7.86E-03
265	2	0.13	1	0.07	0.10	7.86E-03
266	2.5	0.17	1	0.07	0.12	1.07E-02
267	3	0.20	2	0.13	0.17	2.18E-02
268	2.5	0.17	2	0.13	0.15	1.77E-02
269	7	0.47	2	0.13	0.30	7.07E-02
270	3.5	0.23	1	0.07	0.15	1.77E-02
271	3	0.20	1.5	0.10	0.15	1.77E-02
272	3	0.20	1	0.07	0.13	1.40E-02
273	3	0.20	1.5	0.10	0.15	1.77E-02
274	5.5	0.37	3	0.20	0.28	6.31E-02
275	1.5	0.10	1	0.07	0.08	5.46E-03
276	5	0.33	2	0.13	0.23	4.28E-02
277	3	0.20	1.5	0.10	0.15	1.77E-02
278	5	0.33	4	0.27	0.30	7.07E-02

PORE	MAX. DIA. (mm)	MAX. DIA. (Um)	MIN. DIA. (mm)	MIN. DIA. (Um)	AVE. DIA. (Um)	AREA
279	3.5	0.23	2	0.13	0.18	2.64E-02
280	5	0.33	2	0.13	0.23	4.28E-02
281	3	0.20	1.5	0.10	0.15	1.77E-02
282	4	0.27	2.5	0.17	0.22	3.69E-02
283	5	0.33	2	0.13	0.23	4.28E-02
284	2.5	0.17	1.5	0.10	0.13	1.40E-02
285	2	0.13	2	0.13	0.13	1.40E-02
286	2.5	0.17	1	0.07	0.12	1.07E-02
287	4	0.27	2	0.13	0.20	3.14E-02
288	2	0.13	1.5	0.10	0.12	1.07E-02
289	3	0.20	2	0.13	0.17	2.18E-02
290	2.5	0.17	2	0.13	0.15	1.77E-02
291	4	0.27	1	0.07	0.17	2.18E-02
292	4	0.27	1	0.07	0.17	2.18E-02
293	2	0.13	0.5	0.03	0.08	5.46E-03
294	2	0.13	1	0.07	0.10	7.86E-03
295	3.5	0.23	1	0.07	0.15	1.77E-02
296	2.5	0.17	1.5	0.10	0.13	1.40E-02
297	2	0.13	1	0.07	0.10	7.86E-03
298	1.5	0.10	1.5	0.10	0.10	7.86E-03
299	1.5	0.10	1	0.07	0.08	5.46E-03
300	3	0.20	2.5	0.17	0.18	2.64E-02
301	2	0.13	1.5	0.10	0.12	1.07E-02
302	2	0.13	2	0.13	0.13	1.40E-02
303	2.5	0.17	1.5	0.10	0.13	1.40E-02
304	4.5	0.30	2	0.13	0.22	3.69E-02
305	5	0.33	1.5	0.10	0.22	3.69E-02
306	3.5	0.23	2.5	0.17	0.20	3.14E-02
307	2	0.13	1	0.07	0.10	7.86E-03
308	4	0.27	1	0.07	0.17	2.18E-02
309	3	0.20	1.5	0.10	0.15	1.77E-02
310	2	0.13	1	0.07	0.10	7.86E-03
311	2	0.13	1.5	0.10	0.12	1.07E-02
312	2.5	0.17	2	0.13	0.15	1.77E-02
313	2	0.13	1.5	0.10	0.12	1.07E-02
314	2	0.13	2	0.13	0.13	1.40E-02
315	2	0.13	1	0.07	0.10	7.86E-03
316	3.5	0.23	1	0.07	0.15	1.77E-02
317	4	0.27	2	0.13	0.20	3.14E-02
318	4	0.27	1.5	0.10	0.18	2.64E-02
319	3	0.20	2	0.13	0.17	2.18E-02

PORE	MAX. DIA. (mm)	MAX. DIA. (Um)	MIN. DIA. (mm)	MIN. DIA. (Um)	AVE. DIA. (Um)	AREA
320	3	0.20	2	0.13	0.17	2.18E-02
321	4	0.27	1.5	0.10	0.18	2.64E-02
322	2.5	0.17	2	0.13	0.15	1.77E-02
323	3	0.20	2	0.13	0.17	2.18E-02
324	4.5	0.30	1.5	0.10	0.20	3.14E-02
325	1.5	0.10	1	0.07	0.08	5.46E-03
326	4.5	0.30	1.5	0.10	0.20	3.14E-02
327	4	0.27	2	0.13	0.20	3.14E-02
328	3	0.20	1.5	0.10	0.15	1.77E-02
329	3	0.20	1.5	0.10	0.15	1.77E-02
330	2	0.13	2	0.13	0.13	1.40E-02
331	2.5	0.17	2	0.13	0.15	1.77E-02
332	4.5	0.30	1	0.07	0.18	2.64E-02
333	1.5	0.10	1	0.07	0.08	5.46E-03
334	3	0.20	2	0.13	0.17	2.18E-02
335	3	0.20	1	0.07	0.13	1.40E-02
336	2.5	0.17	2.5	0.17	0.17	2.18E-02
337	2.5	0.17	2	0.13	0.15	1.77E-02
338	2.5	0.17	2	0.13	0.15	1.77E-02
339	5	0.33	2	0.13	0.23	4.28E-02
340	3	0.20	1	0.07	0.13	1.40E-02
341	5	0.33	1.5	0.10	0.22	3.69E-02
342	1	0.07	1	0.07	0.07	3.49E-03
343	2.5	0.17	1	0.07	0.12	1.07E-02
344	2	0.13	2	0.13	0.13	1.40E-02
345	3	0.20	1.5	0.10	0.15	1.77E-02
346	4	0.27	1	0.07	0.17	2.18E-02
347	4.5	0.30	1.5	0.10	0.20	3.14E-02
348	2.5	0.17	1	0.07	0.12	1.07E-02
349	2.5	0.17	1.5	0.10	0.13	1.40E-02
350	3	0.20	1.5	0.10	0.15	1.77E-02
351	2	0.13	1	0.07	0.10	7.86E-03
352	3	0.20	2	0.13	0.17	2.18E-02
353	4	0.27	1.5	0.10	0.18	2.64E-02
354	2	0.13	1	0.07	0.10	7.86E-03
355	2	0.13	1.5	0.10	0.12	1.07E-02
356	4.5	0.30	1	0.07	0.18	2.64E-02
357	3	0.20	1	0.07	0.13	1.40E-02
358	4.5	0.30	2	0.13	0.22	3.69E-02
359	2.5	0.17	2	0.13	0.15	1.77E-02
360	3	0.20	1.5	0.10	0.15	1.77E-02

PORE	MAX. DIA. (mm)	MAX. DIA. (Um)	MIN. DIA. (mm)	MIN. DIA. (Um)	AVE. DIA. (Um)	AREA
361	2	0.13	1	0.07	0.10	7.86E-03
362	2	0.13	1	0.07	0.10	7.86E-03
363	4	0.27	2	0.13	0.20	3.14E-02
364	2.5	0.17	1	0.07	0.12	1.07E-02
365	1	0.07	1	0.07	0.07	3.49E-03
366	2	0.13	2	0.13	0.13	1.40E-02
367	1.5	0.10	1.5	0.10	0.10	7.86E-03
368	1.5	0.10	1.5	0.10	0.10	7.86E-03
369	3	0.20	2.5	0.17	0.18	2.64E-02
370	3	0.20	2	0.13	0.17	2.18E-02
371	2	0.13	1	0.07	0.10	7.86E-03
372	3	0.20	1.5	0.10	0.15	1.77E-02
373	3	0.20	1.5	0.10	0.15	1.77E-02
374	2	0.13	1	0.07	0.10	7.86E-03
375	2	0.13	2	0.13	0.13	1.40E-02
376	5	0.33	2.5	0.17	0.25	4.91E-02
377	2	0.13	2	0.13	0.13	1.40E-02
378	3.5	0.23	1.5	0.10	0.17	2.18E-02
379	2	0.13	1.5	0.10	0.12	1.07E-02
380	3	0.20	2	0.13	0.17	2.18E-02
381	2.5	0.17	1.5	0.10	0.13	1.40E-02
382	4	0.27	2	0.13	0.20	3.14E-02
383	3	0.20	2	0.13	0.17	2.18E-02
384	2.5	0.17	1	0.07	0.12	1.07E-02
385	6	0.40	1	0.07	0.23	4.28E-02
386	2	0.13	1.5	0.10	0.12	1.07E-02
387	3	0.20	1	0.07	0.13	1.40E-02
388	6.5	0.43	1.5	0.10	0.27	5.59E-02
389	2	0.13	1	0.07	0.10	7.86E-03
390	2	0.13	2	0.13	0.13	1.40E-02
391	2.5	0.17	2.5	0.17	0.17	2.18E-02
392	2.5	0.17	1.5	0.10	0.13	1.40E-02
393	4	0.27	2.5	0.17	0.22	3.69E-02
394	4	0.27	4	0.27	0.27	5.59E-02
395	3	0.20	2	0.13	0.17	2.18E-02
396	2	0.13	1	0.07	0.10	7.86E-03
397	6	0.40	3	0.20	0.30	7.07E-02
398	3	0.20	3	0.20	0.20	3.14E-02
399	2	0.13	1.5	0.10	0.12	1.07E-02
400	3	0.20	1.5	0.10	0.15	1.77E-02
401	2.5	0.17	2	0.13	0.15	1.77E-02

PORE	MAX. DIA. (mm)	MAX. DIA. (Um)	MIN. DIA. (mm)	MIN. DIA. (Um)	AVE. DIA. (Um)	AREA
402	3	0.20	1.5	0.10	0.15	1.77E-02
403	4	0.27	3	0.20	0.23	4.28E-02
404	2.5	0.17	1	0.07	0.12	1.07E-02
405	10	0.67	1.5	0.10	0.38	1.15E-01
406	2	0.13	1	0.07	0.10	7.86E-03
407	3	0.20	1.5	0.10	0.15	1.77E-02
408	3.5	0.23	1	0.07	0.15	1.77E-02
409	4	0.27	1	0.07	0.17	2.18E-02
410	3	0.20	1.5	0.10	0.15	1.77E-02
411	2.5	0.17	1.5	0.10	0.13	1.40E-02
412	2	0.13	1	0.07	0.10	7.86E-03
413	2	0.13	1	0.07	0.10	7.86E-03
414	1	0.07	1	0.07	0.07	3.49E-03
415	1	0.07	0.5	0.03	0.05	1.96E-03
416	3	0.20	1	0.07	0.13	1.40E-02
417	2	0.13	1	0.07	0.10	7.86E-03
418	4	0.27	2	0.13	0.20	3.14E-02
419	2	0.13	1.5	0.10	0.12	1.07E-02
420	5	0.33	1	0.07	0.20	3.14E-02
421	3	0.20	1	0.07	0.13	1.40E-02
422	4	0.27	2	0.13	0.20	3.14E-02
423	2	0.13	1.5	0.10	0.12	1.07E-02
424	2	0.13	1.5	0.10	0.12	1.07E-02
425	1.5	0.10	1.5	0.10	0.10	7.86E-03
426	5	0.33	2	0.13	0.23	4.28E-02
427	2.5	0.17	2	0.13	0.15	1.77E-02
428	2.5	0.17	1.5	0.10	0.13	1.40E-02
429	4	0.27	1.5	0.10	0.18	2.64E-02
430	5	0.33	2.5	0.17	0.25	4.91E-02
431	1.5	0.10	1.5	0.10	0.10	7.86E-03
432	5	0.33	1.5	0.10	0.22	3.69E-02
433	4	0.27	1.5	0.10	0.18	2.64E-02
434	3	0.20	2	0.13	0.17	2.18E-02
435	2.5	0.17	1.5	0.10	0.13	1.40E-02
436	2	0.13	2	0.13	0.13	1.40E-02
437	2	0.13	1	0.07	0.10	7.86E-03
438	1	0.07	1	0.07	0.07	3.49E-03
439	1.5	0.10	1	0.07	0.08	5.46E-03
440	1.5	0.10	1.5	0.10	0.10	7.86E-03
441	1	0.07	1	0.07	0.07	3.49E-03
442	2	0.13	1.5	0.10	0.12	1.07E-02

PORE	MAX. DIA. (mm)	MAX. DIA. (Um)	MIN. DIA. (mm)	MIN. DIA. (Um)	AVE. DIA. (Um)	AREA
443	3	0.20	1.5	0.10	0.15	1.77E-02
444	2	0.13	1.5	0.10	0.12	1.07E-02
445	3	0.20	1	0.07	0.13	1.40E-02
446	1.5	0.10	1	0.07	0.08	5.46E-03
447	2	0.13	1	0.07	0.10	7.86E-03
448	2.5	0.17	2	0.13	0.15	1.77E-02
449	4	0.27	2	0.13	0.20	3.14E-02
450	2	0.13	1	0.07	0.10	7.86E-03
451	2	0.13	1.5	0.10	0.12	1.07E-02
452	4	0.27	3	0.20	0.23	4.28E-02
453	2.5	0.17	2	0.13	0.15	1.77E-02
454	5	0.33	2	0.13	0.23	4.28E-02
455	3	0.20	2.5	0.17	0.18	2.64E-02
456	2	0.13	1	0.07	0.10	7.86E-03
457	3	0.20	2	0.13	0.17	2.18E-02
458	1	0.07	1	0.07	0.07	3.49E-03
459	2.5	0.17	1	0.07	0.12	1.07E-02
460	3	0.20	1	0.07	0.13	1.40E-02
461	1	0.07	1	0.07	0.07	3.49E-03
462	4	0.27	1.5	0.10	0.18	2.64E-02
463	3	0.20	1.5	0.10	0.15	1.77E-02
464	3	0.20	1.5	0.10	0.15	1.77E-02
465	2	0.13	1	0.07	0.10	7.86E-03
466	4	0.27	2	0.13	0.20	3.14E-02
467	2.5	0.17	1.5	0.10	0.13	1.40E-02
468	2	0.13	2	0.13	0.13	1.40E-02
469	3	0.20	2.5	0.17	0.18	2.64E-02
470	8	0.53	2.5	0.17	0.35	9.62E-02
471	3	0.20	1.5	0.10	0.15	1.77E-02
472	4	0.27	2	0.13	0.20	3.14E-02
473	3	0.20	3	0.20	0.20	3.14E-02
474	3	0.20	1.5	0.10	0.15	1.77E-02
475	2.5	0.17	1.5	0.10	0.13	1.40E-02
476	2.5	0.17	1.5	0.10	0.13	1.40E-02
477	3	0.20	1.5	0.10	0.15	1.77E-02
478	3.5	0.23	2	0.13	0.18	2.64E-02
479	5.5	0.37	2	0.13	0.25	4.91E-02
480	2	0.13	2	0.13	0.13	1.40E-02
481	2	0.13	1	0.07	0.10	7.86E-03
482	3.5	0.23	1	0.07	0.15	1.77E-02
483	5	0.33	1.5	0.10	0.22	3.69E-02

PORE	MAX. DIA. (mm)	MAX. DIA. (Um)	MIN. DIA. (mm)	MIN. DIA. (Um)	AVE. DIA. (Um)	AREA
484	4	0.27	1	0.07	0.17	2.18E-02
485	3.5	0.23	2	0.13	0.18	2.64E-02
486	4	0.27	1.5	0.10	0.18	2.64E-02
487	3	0.20	2.5	0.17	0.18	2.64E-02
488	2.5	0.17	2	0.13	0.15	1.77E-02
489	3	0.20	2	0.13	0.17	2.18E-02
490	3	0.20	1	0.07	0.13	1.40E-02
491	2.5	0.17	1.5	0.10	0.13	1.40E-02
492	4	0.27	2	0.13	0.20	3.14E-02
493	6	0.40	1.5	0.10	0.25	4.91E-02
494	2	0.13	1	0.07	0.10	7.86E-03
495	2.5	0.17	1	0.07	0.12	1.07E-02
496	2	0.13	1	0.07	0.10	7.86E-03
497	1	0.07	1	0.07	0.07	3.49E-03
498	5	0.33	1.5	0.10	0.22	3.69E-02
499	5	0.33	1.5	0.10	0.22	3.69E-02
500	5	0.33	1	0.07	0.20	3.14E-02
501	2.5	0.17	1.5	0.10	0.13	1.40E-02
502	3	0.20	2	0.13	0.17	2.18E-02
503	3	0.20	1.5	0.10	0.15	1.77E-02
504	3	0.20	2	0.13	0.17	2.18E-02
505	3	0.20	1	0.07	0.13	1.40E-02
506	2.5	0.17	1.5	0.10	0.13	1.40E-02
507	3	0.20	2	0.13	0.17	2.18E-02
508	5	0.33	1.5	0.10	0.22	3.69E-02
509	3	0.20	1.5	0.10	0.15	1.77E-02
510	3	0.20	2	0.13	0.17	2.18E-02
511	2	0.13	1	0.07	0.10	7.86E-03
512	1.5	0.10	1	0.07	0.08	5.46E-03
513	3	0.20	2	0.13	0.17	2.18E-02
514	4	0.27	1	0.07	0.17	2.18E-02
AVE	3.00	0.20	1.60	0.11	0.15	1.05E+01
STD. DEV.		0.08		0.04		

FLOW RATE:	100 mL/min	
SAMPLE ID:	H4/a	
S:		1
PHOTO NO.		80
MAGNIFICATION:	15.0 K	
NO. OF PORES		696

PORE	MAX. DIA. (mm)	MAX. DIA. (µm)	MIN. DIA. (mm)	MIN. DIA. (µm)	AVE. DIA. (µm)	AREA (µm)(µm)
1	2	0.13	1	0.07	0.10	7.86E-03
2	2	0.13	1	0.07	0.10	7.86E-03
3	2	0.13	1.5	0.10	0.12	1.07E-02
4	4	0.27	3	0.20	0.23	4.28E-02
5	2	0.13	1	0.07	0.10	7.86E-03
6	2.5	0.17	1.5	0.10	0.13	1.40E-02
7	3	0.20	2	0.13	0.17	2.18E-02
8	3.5	0.23	1	0.07	0.15	1.77E-02
9	2	0.13	1	0.07	0.10	7.86E-03
10	2	0.13	1	0.07	0.10	7.86E-03
11	3	0.20	2	0.13	0.17	2.18E-02
12	3	0.20	2.5	0.17	0.18	2.64E-02
13	1.5	0.10	1	0.07	0.08	5.46E-03
14	2.5	0.17	1.5	0.10	0.13	1.40E-02
15	3	0.20	2.5	0.17	0.18	2.64E-02
16	4	0.27	2.5	0.17	0.22	3.69E-02
17	2	0.13	2	0.13	0.13	1.40E-02
18	2.5	0.17	2.5	0.17	0.17	2.18E-02
19	2.5	0.17	2.5	0.17	0.17	2.18E-02
20	1.5	0.10	1	0.07	0.08	5.46E-03
21	1	0.07	1	0.07	0.07	3.49E-03
22	1.5	0.10	1.5	0.10	0.10	7.86E-03
23	0.5	0.03	0.5	0.03	0.03	8.73E-04
24	1	0.07	1	0.07	0.07	3.49E-03
25	2	0.13	1.5	0.10	0.12	1.07E-02
26	2	0.13	0.5	0.03	0.08	5.46E-03
27	1	0.07	0.5	0.03	0.05	1.96E-03
28	2.5	0.17	1	0.07	0.12	1.07E-02
29	5.5	0.37	2.5	0.17	0.27	5.59E-02
30	4	0.27	2.5	0.17	0.22	3.69E-02
31	2.5	0.17	1	0.07	0.12	1.07E-02
32	3	0.20	1.5	0.10	0.15	1.77E-02

PORE	MAX. DIA.	MAX. DIA.	MIN. DIA.	MIN. DIA.	AVE. DIA.	AREA
	(mm)	(μm)	(mm)	(μm)	(μm)	(μm)(μm)
33	2.5	0.17	1.5	0.10	0.13	1.40E-02
34	4	0.27	2	0.13	0.20	3.14E-02
35	1.5	0.10	1	0.07	0.08	5.46E-03
36	3	0.20	1.5	0.10	0.15	1.77E-02
37	2.5	0.17	2	0.13	0.15	1.77E-02
38	2.5	0.17	1.5	0.10	0.13	1.40E-02
39	2.5	0.17	2	0.13	0.15	1.77E-02
40	2.5	0.17	2	0.13	0.15	1.77E-02
41	2.5	0.17	1.5	0.10	0.13	1.40E-02
42	3.5	0.23	2	0.13	0.18	2.64E-02
43	3	0.20	2.5	0.17	0.18	2.64E-02
44	2	0.13	1	0.07	0.10	7.86E-03
45	4	0.27	2	0.13	0.20	3.14E-02
46	3	0.20	1.5	0.10	0.15	1.77E-02
47	2	0.13	1	0.07	0.10	7.86E-03
48	2	0.13	1.5	0.10	0.12	1.07E-02
49	2	0.13	1.5	0.10	0.12	1.07E-02
50	1	0.07	0.5	0.03	0.05	1.96E-03
51	2	0.13	2	0.13	0.13	1.40E-02
52	3	0.20	1.5	0.10	0.15	1.77E-02
53	4.5	0.30	1.5	0.10	0.20	3.14E-02
54	4	0.27	1.5	0.10	0.18	2.64E-02
55	3	0.20	1.5	0.10	0.15	1.77E-02
56	2	0.13	2	0.13	0.13	1.40E-02
57	1.5	0.10	1	0.07	0.08	5.46E-03
58	1.5	0.10	1.5	0.10	0.10	7.86E-03
59	4	0.27	2.5	0.17	0.22	3.69E-02
60	2	0.13	1.5	0.10	0.12	1.07E-02
61	1.5	0.10	1	0.07	0.08	5.46E-03
62	2	0.13	2	0.13	0.13	1.40E-02
63	2.5	0.17	1.5	0.10	0.13	1.40E-02
64	2.5	0.17	2	0.13	0.15	1.77E-02
65	2.5	0.17	1.5	0.10	0.13	1.40E-02
66	3	0.20	1	0.07	0.13	1.40E-02
67	2.5	0.17	1.5	0.10	0.13	1.40E-02
68	2.5	0.17	1.5	0.10	0.13	1.40E-02
69	1.5	0.10	1	0.07	0.08	5.46E-03
70	1	0.07	1	0.07	0.07	3.49E-03
71	1.5	0.10	1	0.07	0.08	5.46E-03
72	4	0.27	3	0.20	0.23	4.28E-02
73	1.5	0.10	1	0.07	0.08	5.46E-03

PORE	MAX. DIA.	MAX. DIA.	MIN. DIA.	MIN. DIA.	AVE. DIA.	AREA
	(mm)	(μm)	(mm)	(μm)	(μm)	(μm)(μm)
75	1	0.07	1	0.07	0.07	3.49E-03
76	1.5	0.10	1	0.07	0.08	5.46E-03
77	1	0.07	1	0.07	0.07	3.49E-03
78	3	0.20	2	0.13	0.17	2.18E-02
79	3	0.20	1	0.07	0.13	1.40E-02
80	1.5	0.10	1.5	0.10	0.10	7.86E-03
81	2	0.13	1.5	0.10	0.12	1.07E-02
82	4	0.27	2	0.13	0.20	3.14E-02
83	3	0.20	2	0.13	0.17	2.18E-02
84	2.5	0.17	1.5	0.10	0.13	1.40E-02
85	3	0.20	2.5	0.17	0.18	2.64E-02
86	3	0.20	1.5	0.10	0.15	1.77E-02
87	1	0.07	1	0.07	0.07	3.49E-03
88	3	0.20	1.5	0.10	0.15	1.77E-02
89	1.5	0.10	1	0.07	0.08	5.46E-03
90	1	0.07	1	0.07	0.07	3.49E-03
91	3	0.20	2	0.13	0.17	2.18E-02
92	3.5	0.23	2	0.13	0.18	2.64E-02
93	2	0.13	0.5	0.03	0.08	5.46E-03
94	3	0.20	2	0.13	0.17	2.18E-02
95	2.5	0.17	1.5	0.10	0.13	1.40E-02
96	4	0.27	3	0.20	0.23	4.28E-02
97	1	0.07	0.5	0.03	0.05	1.96E-03
98	2.5	0.17	1	0.07	0.12	1.07E-02
99	1.5	0.10	0.5	0.03	0.07	3.49E-03
100	1	0.07	1	0.07	0.07	3.49E-03
101	1.5	0.10	1.5	0.10	0.10	7.86E-03
102	2	0.13	1	0.07	0.10	7.86E-03
103	2	0.13	1	0.07	0.10	7.86E-03
104	3	0.20	2	0.13	0.17	2.18E-02
105	3	0.20	1.5	0.10	0.15	1.77E-02
106	2	0.13	1.5	0.10	0.12	1.07E-02
107	2	0.13	1.5	0.10	0.12	1.07E-02
108	2	0.13	1	0.07	0.10	7.86E-03
109	2	0.13	1	0.07	0.10	7.86E-03
110	2.5	0.17	0.5	0.03	0.10	7.86E-03
111	1.5	0.10	1	0.07	0.08	5.46E-03
112	3	0.20	1.5	0.10	0.15	1.77E-02
113	2	0.13	2	0.13	0.13	1.40E-02
114	1.5	0.10	1.5	0.10	0.10	7.86E-03
115	2	0.13	1.5	0.10	0.12	1.07E-02

PORE	MAX. DIA.	MAX. DIA.	MIN. DIA.	MIN. DIA.	AVE. DIA.	AREA
	(mm)	(μm)	(mm)	(μm)	(μm)	(μm)(μm)
116	1.5	0.10	1	0.07	0.08	5.46E-03
117	3	0.20	2	0.13	0.17	2.18E-02
118	4	0.27	2	0.13	0.20	3.14E-02
119	2.5	0.17	1.5	0.10	0.13	1.40E-02
120	3	0.20	1.5	0.10	0.15	1.77E-02
121	2	0.13	1	0.07	0.10	7.86E-03
122	3.5	0.23	1.5	0.10	0.17	2.18E-02
123	4	0.27	2	0.13	0.20	3.14E-02
124	3	0.20	2	0.13	0.17	2.18E-02
125	4	0.27	2	0.13	0.20	3.14E-02
126	1.5	0.10	1	0.07	0.08	5.46E-03
127	2.5	0.17	2	0.13	0.15	1.77E-02
128	2	0.13	1	0.07	0.10	7.86E-03
129	3	0.20	2	0.13	0.17	2.18E-02
130	3	0.20	1	0.07	0.13	1.40E-02
131	3	0.20	1.5	0.10	0.15	1.77E-02
132	2.5	0.17	1.5	0.10	0.13	1.40E-02
133	2	0.13	1	0.07	0.10	7.86E-03
134	2.5	0.17	2	0.13	0.15	1.77E-02
135	2	0.13	1	0.07	0.10	7.86E-03
136	3	0.20	1.5	0.10	0.15	1.77E-02
137	2	0.13	2	0.13	0.13	1.40E-02
138	3	0.20	1.5	0.10	0.15	1.77E-02
139	3	0.20	1.5	0.10	0.15	1.77E-02
140	2	0.13	1	0.07	0.10	7.86E-03
141	4	0.27	2.5	0.17	0.22	3.69E-02
142	2	0.13	1	0.07	0.10	7.86E-03
143	3	0.20	1.5	0.10	0.15	1.77E-02
144	2	0.13	1.5	0.10	0.12	1.07E-02
145	2.5	0.17	1	0.07	0.12	1.07E-02
146	3	0.20	2	0.13	0.17	2.18E-02
147	2	0.13	1.5	0.10	0.12	1.07E-02
148	2	0.13	1.5	0.10	0.12	1.07E-02
149	2	0.13	0.5	0.03	0.08	5.46E-03
150	2	0.13	1	0.07	0.10	7.86E-03
151	1	0.07	1	0.07	0.07	3.49E-03
152	2.5	0.17	1	0.07	0.12	1.07E-02
153	2.5	0.17	1	0.07	0.12	1.07E-02
154	3	0.20	1.5	0.10	0.15	1.77E-02
155	2	0.13	1.5	0.10	0.12	1.07E-02
156	2	0.13	1	0.07	0.10	7.86E-03

PORE	MAX. DIA.	MAX. DIA.	MIN. DIA.	MIN. DIA.	AVE. DIA.	AREA
	(mm)	(µm)	(mm)	(µm)	(µm)	(µm)(µm)
157	3	0.20	1.5	0.10	0.15	1.77E-02
158	2.5	0.17	1.5	0.10	0.13	1.40E-02
159	2	0.13	1	0.07	0.10	7.86E-03
160	3	0.20	2	0.13	0.17	2.18E-02
161	2.5	0.17	1.5	0.10	0.13	1.40E-02
162	4	0.27	1.5	0.10	0.18	2.64E-02
163	3	0.20	1.5	0.10	0.15	1.77E-02
164	3	0.20	1	0.07	0.13	1.40E-02
165	6	0.40	2	0.13	0.27	5.59E-02
166	4	0.27	2	0.13	0.20	3.14E-02
167	3	0.20	1.5	0.10	0.15	1.77E-02
168	4	0.27	2.5	0.17	0.22	3.69E-02
169	4	0.27	1.5	0.10	0.18	2.64E-02
170	2.5	0.17	1.5	0.10	0.13	1.40E-02
171	2.5	0.17	1	0.07	0.12	1.07E-02
172	1.5	0.10	1.5	0.10	0.10	7.86E-03
173	2	0.13	1	0.07	0.10	7.86E-03
174	2	0.13	1.5	0.10	0.12	1.07E-02
175	1	0.07	1	0.07	0.07	3.49E-03
176	3	0.20	1	0.07	0.13	1.40E-02
177	2	0.13	1	0.07	0.10	7.86E-03
178	2	0.13	1	0.07	0.10	7.86E-03
179	4	0.27	2	0.13	0.20	3.14E-02
180	4	0.27	1	0.07	0.17	2.18E-02
181	3	0.20	1	0.07	0.13	1.40E-02
182	3.5	0.23	1	0.07	0.15	1.77E-02
183	2	0.13	1	0.07	0.10	7.86E-03
184	2	0.13	1	0.07	0.10	7.86E-03
185	2	0.13	1.5	0.10	0.12	1.07E-02
186	2.5	0.17	2	0.13	0.15	1.77E-02
187	3.5	0.23	2	0.13	0.18	2.64E-02
188	2.5	0.17	1.5	0.10	0.13	1.40E-02
189	3	0.20	1.5	0.10	0.15	1.77E-02
190	3	0.20	1	0.07	0.13	1.40E-02
191	3	0.20	2	0.13	0.17	2.18E-02
192	4.5	0.30	2	0.13	0.22	3.69E-02
193	4.5	0.30	2	0.13	0.22	3.69E-02
194	2	0.13	1.5	0.10	0.12	1.07E-02
195	3	0.20	2	0.13	0.17	2.18E-02
196	3	0.20	2	0.13	0.17	2.18E-02
197	3	0.20	2	0.13	0.17	2.18E-02

PORE	MAX. DIA.	MAX. DIA.	MIN. DIA.	MIN. DIA.	AVE. DIA.	AREA
	(mm)	(μm)	(mm)	(μm)	(μm)	(μm)(μm)
198	3.5	0.23	2	0.13	0.18	2.64E-02
199	4	0.27	2	0.13	0.20	3.14E-02
200	1	0.07	0.5	0.03	0.05	1.96E-03
201	2	0.13	1	0.07	0.10	7.86E-03
202	2.5	0.17	1.5	0.10	0.13	1.40E-02
203	2	0.13	2	0.13	0.13	1.40E-02
204	2	0.13	1	0.07	0.10	7.86E-03
205	1	0.07	1	0.07	0.07	3.49E-03
206	3	0.20	1.5	0.10	0.15	1.77E-02
207	3	0.20	3	0.20	0.20	3.14E-02
208	2	0.13	1	0.07	0.10	7.86E-03
209	2	0.13	1.5	0.10	0.12	1.07E-02
210	3	0.20	2	0.13	0.17	2.18E-02
211	2.5	0.17	1	0.07	0.12	1.07E-02
212	4	0.27	1.5	0.10	0.18	2.64E-02
213	2	0.13	1.5	0.10	0.12	1.07E-02
214	3.5	0.23	1.5	0.10	0.17	2.18E-02
215	3	0.20	2	0.13	0.17	2.18E-02
216	3	0.20	1.5	0.10	0.15	1.77E-02
217	3	0.20	2	0.13	0.17	2.18E-02
218	4	0.27	1.5	0.10	0.18	2.64E-02
219	1	0.07	1	0.07	0.07	3.49E-03
220	2	0.13	1	0.07	0.10	7.86E-03
221	2	0.13	1	0.07	0.10	7.86E-03
222	1	0.07	1	0.07	0.07	3.49E-03
223	4	0.27	2	0.13	0.20	3.14E-02
224	2	0.13	2	0.13	0.13	1.40E-02
225	2	0.13	2	0.13	0.13	1.40E-02
226	2.5	0.17	2	0.13	0.15	1.77E-02
227	1.5	0.10	1	0.07	0.08	5.46E-03
228	2	0.13	1.5	0.10	0.12	1.07E-02
229	3	0.20	1	0.07	0.13	1.40E-02
230	3	0.20	2	0.13	0.17	2.18E-02
231	1	0.07	1	0.07	0.07	3.49E-03
232	3.5	0.23	2.5	0.17	0.20	3.14E-02
233	2	0.13	1	0.07	0.10	7.86E-03
234	2	0.13	1	0.07	0.10	7.86E-03
235	1.5	0.10	1.5	0.10	0.10	7.86E-03
236	2	0.13	1.5	0.10	0.12	1.07E-02
237	1	0.07	1	0.07	0.07	3.49E-03
238	2.5	0.17	2	0.13	0.15	1.77E-02

PORE	MAX. DIA.	MAX. DIA.	MIN. DIA.	MIN. DIA.	AVE. DIA.	AREA
	(mm)	(μm)	(mm)	(μm)	(μm)	(μm)(μm)
239	3	0.20	2.5	0.17	0.18	2.64E-02
240	3	0.20	2	0.13	0.17	2.18E-02
241	3	0.20	1.5	0.10	0.15	1.77E-02
242	3	0.20	1.5	0.10	0.15	1.77E-02
243	2	0.13	1.5	0.10	0.12	1.07E-02
244	3	0.20	2.5	0.17	0.18	2.64E-02
245	1.5	0.10	1	0.07	0.08	5.46E-03
246	2.5	0.17	1	0.07	0.12	1.07E-02
247	2	0.13	1.5	0.10	0.12	1.07E-02
248	3	0.20	1.5	0.10	0.15	1.77E-02
249	6	0.40	1.5	0.10	0.25	4.91E-02
250	4	0.27	1.5	0.10	0.18	2.64E-02
251	6	0.40	2	0.13	0.27	5.59E-02
252	2.5	0.17	1.5	0.10	0.13	1.40E-02
253	2	0.13	1.5	0.10	0.12	1.07E-02
254	2	0.13	1.5	0.10	0.12	1.07E-02
255	2	0.13	1	0.07	0.10	7.86E-03
256	1	0.07	1	0.07	0.07	3.49E-03
257	2	0.13	1	0.07	0.10	7.86E-03
258	2.5	0.17	2	0.13	0.15	1.77E-02
259	2.5	0.17	1.5	0.10	0.13	1.40E-02
260	1.5	0.10	1.5	0.10	0.10	7.86E-03
261	3	0.20	1.5	0.10	0.15	1.77E-02
262	3	0.20	1.5	0.10	0.15	1.77E-02
263	2	0.13	1.5	0.10	0.12	1.07E-02
264	3.5	0.23	1	0.07	0.15	1.77E-02
265	5	0.33	3	0.20	0.27	5.59E-02
266	3	0.20	1	0.07	0.13	1.40E-02
267	4	0.27	1.5	0.10	0.18	2.64E-02
268	2	0.13	1	0.07	0.10	7.86E-03
269	2	0.13	1.5	0.10	0.12	1.07E-02
270	2	0.13	1.5	0.10	0.12	1.07E-02
271	5.5	0.37	1.5	0.10	0.23	4.28E-02
272	2	0.13	2	0.13	0.13	1.40E-02
273	4	0.27	3	0.20	0.23	4.28E-02
274	2.5	0.17	1.5	0.10	0.13	1.40E-02
275	2.5	0.17	2	0.13	0.15	1.77E-02
276	4	0.27	1.5	0.10	0.18	2.64E-02
277	2	0.13	1.5	0.10	0.12	1.07E-02
278	3	0.20	1.5	0.10	0.15	1.77E-02
279	2	0.13	1	0.07	0.10	7.86E-03

PORE	MAX. DIA.	MAX. DIA.	MIN. DIA.	MIN. DIA.	AVE. DIA.	AREA
	(mm)	(μm)	(mm)	(μm)	(μm)	(μm)(μm)
280	2	0.13	2	0.13	0.13	1.40E-02
281	2	0.13	1.5	0.10	0.12	1.07E-02
282	3	0.20	1.5	0.10	0.15	1.77E-02
283	2	0.13	1	0.07	0.10	7.86E-03
284	2	0.13	1.5	0.10	0.12	1.07E-02
285	3	0.20	1	0.07	0.13	1.40E-02
286	3	0.20	2	0.13	0.17	2.18E-02
287	2	0.13	1	0.07	0.10	7.86E-03
288	2.5	0.17	1.5	0.10	0.13	1.40E-02
289	1.5	0.10	1	0.07	0.08	5.46E-03
290	3	0.20	1	0.07	0.13	1.40E-02
291	1.5	0.10	1.5	0.10	0.10	7.86E-03
292	1.5	0.10	1	0.07	0.08	5.46E-03
293	3	0.20	1	0.07	0.13	1.40E-02
294	1.5	0.10	1.5	0.10	0.10	7.86E-03
295	2.5	0.17	1.5	0.10	0.13	1.40E-02
296	4	0.27	1.5	0.10	0.18	2.64E-02
297	2.5	0.17	1.5	0.10	0.13	1.40E-02
298	2	0.13	1	0.07	0.10	7.86E-03
299	2	0.13	1.5	0.10	0.12	1.07E-02
300	3	0.20	1.5	0.10	0.15	1.77E-02
301	4.5	0.30	1.5	0.10	0.20	3.14E-02
302	1.5	0.10	1	0.07	0.08	5.46E-03
303	2	0.13	1	0.07	0.10	7.86E-03
304	2	0.13	1.5	0.10	0.12	1.07E-02
305	2	0.13	1	0.07	0.10	7.86E-03
306	1.5	0.10	1	0.07	0.08	5.46E-03
307	1.5	0.10	1	0.07	0.08	5.46E-03
308	2	0.13	2	0.13	0.13	1.40E-02
309	3	0.20	1	0.07	0.13	1.40E-02
310	2	0.13	1	0.07	0.10	7.86E-03
311	2.5	0.17	1.5	0.10	0.13	1.40E-02
312	3	0.20	2	0.13	0.17	2.18E-02
313	3.5	0.23	2	0.13	0.18	2.64E-02
314	1	0.07	0.5	0.03	0.05	1.96E-03
315	3.5	0.23	2.5	0.17	0.20	3.14E-02
316	2	0.13	2	0.13	0.13	1.40E-02
317	1.5	0.10	1.5	0.10	0.10	7.86E-03
318	2.5	0.17	1.5	0.10	0.13	1.40E-02
319	2	0.13	1	0.07	0.10	7.86E-03
320	3	0.20	1.5	0.10	0.15	1.77E-02

PORE	MAX. DIA.	MAX. DIA.	MIN. DIA.	MIN. DIA.	AVE. DIA.	AREA
	(mm)	(μm)	(mm)	(μm)	(μm)	(μm)(μm)
321	3	0.20	1.5	0.10	0.15	1.77E-02
322	3	0.20	1.5	0.10	0.15	1.77E-02
323	1.5	0.10	1.5	0.10	0.10	7.86E-03
324	4	0.27	2	0.13	0.20	3.14E-02
325	2	0.13	2	0.13	0.13	1.40E-02
326	2	0.13	1.5	0.10	0.12	1.07E-02
327	1.5	0.10	1	0.07	0.08	5.46E-03
328	1.5	0.10	1	0.07	0.08	5.46E-03
329	4	0.27	2.5	0.17	0.22	3.69E-02
330	5	0.33	1	0.07	0.20	3.14E-02
331	3	0.20	1.5	0.10	0.15	1.77E-02
332	2	0.13	1	0.07	0.10	7.86E-03
333	2	0.13	1	0.07	0.10	7.86E-03
334	4	0.27	3	0.20	0.23	4.28E-02
335	3	0.20	1.5	0.10	0.15	1.77E-02
336	2	0.13	1	0.07	0.10	7.86E-03
337	2	0.13	1	0.07	0.10	7.86E-03
338	2.5	0.17	1	0.07	0.12	1.07E-02
339	2.5	0.17	1.5	0.10	0.13	1.40E-02
340	2	0.13	1	0.07	0.10	7.86E-03
341	1.5	0.10	1	0.07	0.08	5.46E-03
342	2	0.13	1.5	0.10	0.12	1.07E-02
343	1.5	0.10	1	0.07	0.08	5.46E-03
344	1.5	0.10	1	0.07	0.08	5.46E-03
345	2.5	0.17	1	0.07	0.12	1.07E-02
346	2.5	0.17	1.5	0.10	0.13	1.40E-02
347	3	0.20	1	0.07	0.13	1.40E-02
348	2	0.13	1	0.07	0.10	7.86E-03
349	2	0.13	1	0.07	0.10	7.86E-03
350	2.5	0.17	1	0.07	0.12	1.07E-02
351	1.5	0.10	0.5	0.03	0.07	3.49E-03
352	3.5	0.23	2	0.13	0.18	2.64E-02
353	1.5	0.10	1	0.07	0.08	5.46E-03
354	2.5	0.17	1.5	0.10	0.13	1.40E-02
355	3	0.20	2	0.13	0.17	2.18E-02
356	2	0.13	1	0.07	0.10	7.86E-03
357	2.5	0.17	2	0.13	0.15	1.77E-02
358	4	0.27	1.5	0.10	0.18	2.64E-02
359	2.5	0.17	1.5	0.10	0.13	1.40E-02
360	2.5	0.17	2	0.13	0.15	1.77E-02
361	2	0.13	1.5	0.10	0.12	1.07E-02

PORE	MAX. DIA.	MAX. DIA.	MIN. DIA.	MIN. DIA.	AVE. DIA.	AREA
	(mm)	(μm)	(mm)	(μm)	(μm)	(μm)(μm)
362	2.5	0.17	1.5	0.10	0.13	1.40E-02
363	2	0.13	1.5	0.10	0.12	1.07E-02
364	1.5	0.10	1	0.07	0.08	5.46E-03
365	2	0.13	1	0.07	0.10	7.86E-03
366	2.5	0.17	2	0.13	0.15	1.77E-02
367	2	0.13	1.5	0.10	0.12	1.07E-02
368	5	0.33	3	0.20	0.27	5.59E-02
369	1	0.07	1	0.07	0.07	3.49E-03
370	2	0.13	1	0.07	0.10	7.86E-03
371	3	0.20	1.5	0.10	0.15	1.77E-02
372	3	0.20	2	0.13	0.17	2.18E-02
373	2	0.13	1	0.07	0.10	7.86E-03
374	2	0.13	1	0.07	0.10	7.86E-03
375	2.5	0.17	1	0.07	0.12	1.07E-02
376	2	0.13	1.5	0.10	0.12	1.07E-02
377	2.5	0.17	1.5	0.10	0.13	1.40E-02
378	2	0.13	1	0.07	0.10	7.86E-03
379	2.5	0.17	1.5	0.10	0.13	1.40E-02
380	1	0.07	1	0.07	0.07	3.49E-03
381	3.5	0.23	1.5	0.10	0.17	2.18E-02
382	3.5	0.23	1	0.07	0.15	1.77E-02
383	6.5	0.43	2	0.13	0.28	6.31E-02
384	2	0.13	2	0.13	0.13	1.40E-02
385	2	0.13	1.5	0.10	0.12	1.07E-02
386	5	0.33	3	0.20	0.27	5.59E-02
387	1	0.07	1	0.07	0.07	3.49E-03
388	3	0.20	1.5	0.10	0.15	1.77E-02
389	3	0.20	1	0.07	0.13	1.40E-02
390	3	0.20	1.5	0.10	0.15	1.77E-02
391	3.5	0.23	1	0.07	0.15	1.77E-02
392	6.5	0.43	1.5	0.10	0.27	5.59E-02
393	2	0.13	1.5	0.10	0.12	1.07E-02
394	2.5	0.17	1	0.07	0.12	1.07E-02
395	3	0.20	2	0.13	0.17	2.18E-02
396	3	0.20	2	0.13	0.17	2.18E-02
397	4	0.27	1.5	0.10	0.18	2.64E-02
398	1	0.07	1	0.07	0.07	3.49E-03
399	2	0.13	1.5	0.10	0.12	1.07E-02
400	1.5	0.10	1.5	0.10	0.10	7.86E-03
401	2	0.13	1	0.07	0.10	7.86E-03
402	2	0.13	1.5	0.10	0.12	1.07E-02

PORE	MAX. DIA.	MAX. DIA.	MIN. DIA.	MIN. DIA.	AVE. DIA.	AREA
	(mm)	(µm)	(mm)	(µm)	(µm)	(µm)(µm)
403	1.5	0.10	1	0.07	0.08	5.46E-03
404	1.5	0.10	1.5	0.10	0.10	7.86E-03
405	1.5	0.10	1.5	0.10	0.10	7.86E-03
406	2.5	0.17	1.5	0.10	0.13	1.40E-02
407	2	0.13	1	0.07	0.10	7.86E-03
408	2	0.13	1	0.07	0.10	7.86E-03
409	4	0.27	3	0.20	0.23	4.28E-02
410	3	0.20	2	0.13	0.17	2.18E-02
411	3	0.20	2	0.13	0.17	2.18E-02
412	3	0.20	2	0.13	0.17	2.18E-02
413	2	0.13	1.5	0.10	0.12	1.07E-02
414	3.5	0.23	2	0.13	0.18	2.64E-02
415	2	0.13	1.5	0.10	0.12	1.07E-02
416	2	0.13	2	0.13	0.13	1.40E-02
417	2.5	0.17	2	0.13	0.15	1.77E-02
418	1	0.07	1	0.07	0.07	3.49E-03
419	2.5	0.17	1	0.07	0.12	1.07E-02
420	2	0.13	1.5	0.10	0.12	1.07E-02
421	2	0.13	1	0.07	0.10	7.86E-03
422	3	0.20	1.5	0.10	0.15	1.77E-02
423	3	0.20	2	0.13	0.17	2.18E-02
424	2	0.13	1	0.07	0.10	7.86E-03
425	2	0.13	1.5	0.10	0.12	1.07E-02
426	2.5	0.17	2	0.13	0.15	1.77E-02
427	2	0.13	1.5	0.10	0.12	1.07E-02
428	2.5	0.17	1	0.07	0.12	1.07E-02
429	2	0.13	1	0.07	0.10	7.86E-03
430	5	0.33	1.5	0.10	0.22	3.69E-02
431	2	0.13	1.5	0.10	0.12	1.07E-02
432	2.5	0.17	2	0.13	0.15	1.77E-02
433	3.5	0.23	1.5	0.10	0.17	2.18E-02
434	3	0.20	1	0.07	0.13	1.40E-02
435	3	0.20	2	0.13	0.17	2.18E-02
436	2	0.13	1.5	0.10	0.12	1.07E-02
437	2	0.13	1	0.07	0.10	7.86E-03
438	2.5	0.17	1.5	0.10	0.13	1.40E-02
439	1.5	0.10	1	0.07	0.08	5.46E-03
440	1.5	0.10	1	0.07	0.08	5.46E-03
441	2	0.13	1	0.07	0.10	7.86E-03
442	2	0.13	2	0.13	0.13	1.40E-02
443	2	0.13	1	0.07	0.10	7.86E-03

PORE	MAX. DIA.	MAX. DIA.	MIN. DIA.	MIN. DIA.	AVE. DIA.	AREA
	(mm)	(µm)	(mm)	(µm)	(µm)	(µm)(µm)
444	4	0.27	1	0.07	0.17	2.18E-02
445	2	0.13	1.5	0.10	0.12	1.07E-02
446	1.5	0.10	1	0.07	0.08	5.46E-03
447	2.5	0.17	1.5	0.10	0.13	1.40E-02
448	5	0.33	2	0.13	0.23	4.28E-02
449	4	0.27	2	0.13	0.20	3.14E-02
450	3	0.20	1.5	0.10	0.15	1.77E-02
451	4.5	0.30	2.5	0.17	0.23	4.28E-02
452	1.5	0.10	1.5	0.10	0.10	7.86E-03
453	1.5	0.10	1.5	0.10	0.10	7.86E-03
454	2	0.13	2	0.13	0.13	1.40E-02
455	3	0.20	1.5	0.10	0.15	1.77E-02
456	2	0.13	1.5	0.10	0.12	1.07E-02
457	1	0.07	1	0.07	0.07	3.49E-03
458	3.5	0.23	1	0.07	0.15	1.77E-02
459	2	0.13	1	0.07	0.10	7.86E-03
460	2	0.13	2	0.13	0.13	1.40E-02
461	3	0.20	2.5	0.17	0.18	2.64E-02
462	2.5	0.17	1.5	0.10	0.13	1.40E-02
463	1.5	0.10	1	0.07	0.08	5.46E-03
464	1.5	0.10	1	0.07	0.08	5.46E-03
465	3	0.20	2	0.13	0.17	2.18E-02
466	2	0.13	1	0.07	0.10	7.86E-03
467	1.5	0.10	1	0.07	0.08	5.46E-03
468	4	0.27	3	0.20	0.23	4.28E-02
469	3.5	0.23	1.5	0.10	0.17	2.18E-02
470	2.5	0.17	2	0.13	0.15	1.77E-02
471	3	0.20	2	0.13	0.17	2.18E-02
472	1.5	0.10	1	0.07	0.08	5.46E-03
473	1.5	0.10	1.5	0.10	0.10	7.86E-03
474	6	0.40	2.5	0.17	0.28	6.31E-02
475	3.5	0.23	2.5	0.17	0.20	3.14E-02
476	2	0.13	1.5	0.10	0.12	1.07E-02
477	2.5	0.17	2	0.13	0.15	1.77E-02
478	2.5	0.17	1	0.07	0.12	1.07E-02
479	2	0.13	1.5	0.10	0.12	1.07E-02
480	2	0.13	1	0.07	0.10	7.86E-03
481	1	0.07	1	0.07	0.07	3.49E-03
482	2	0.13	1.5	0.10	0.12	1.07E-02
483	2	0.13	1	0.07	0.10	7.86E-03
484	1.5	0.10	1	0.07	0.08	5.46E-03

PORE	MAX. DIA.	MAX. DIA.	MIN. DIA.	MIN. DIA.	AVE. DIA.	AREA
	(mm)	(µm)	(mm)	(µm)	(µm)	(µm)(µm)
485	2.5	0.17	1	0.07	0.12	1.07E-02
486	3	0.20	1.5	0.10	0.15	1.77E-02
487	3	0.20	2	0.13	0.17	2.18E-02
488	1.5	0.10	1.5	0.10	0.10	7.86E-03
489	4	0.27	2.5	0.17	0.22	3.69E-02
490	2	0.13	1	0.07	0.10	7.86E-03
491	3	0.20	2.5	0.17	0.18	2.64E-02
492	2	0.13	1	0.07	0.10	7.86E-03
493	2	0.13	2	0.13	0.13	1.40E-02
494	2	0.13	1.5	0.10	0.12	1.07E-02
495	2	0.13	2	0.13	0.13	1.40E-02
496	1.5	0.10	1	0.07	0.08	5.46E-03
497	2	0.13	2	0.13	0.13	1.40E-02
498	3.5	0.23	1	0.07	0.15	1.77E-02
499	1.5	0.10	1	0.07	0.08	5.46E-03
500	3	0.20	1.5	0.10	0.15	1.77E-02
501	2.5	0.17	1.5	0.10	0.13	1.40E-02
502	2	0.13	1.5	0.10	0.12	1.07E-02
503	1.5	0.10	1	0.07	0.08	5.46E-03
504	2.5	0.17	1.5	0.10	0.13	1.40E-02
505	3	0.20	2	0.13	0.17	2.18E-02
506	3	0.20	1	0.07	0.13	1.40E-02
507	2	0.13	1	0.07	0.10	7.86E-03
508	2	0.13	1.5	0.10	0.12	1.07E-02
509	2.5	0.17	1.5	0.10	0.13	1.40E-02
510	2	0.13	1	0.07	0.10	7.86E-03
511	1	0.07	1	0.07	0.07	3.49E-03
512	1.5	0.10	1	0.07	0.08	5.46E-03
513	1.5	0.10	1	0.07	0.08	5.46E-03
514	2	0.13	1.5	0.10	0.12	1.07E-02
515	2	0.13	1	0.07	0.10	7.86E-03
516	2.5	0.17	1.5	0.10	0.13	1.40E-02
517	2.5	0.17	1.5	0.10	0.13	1.40E-02
518	3	0.20	2	0.13	0.17	2.18E-02
519	4	0.27	3	0.20	0.23	4.28E-02
520	2.5	0.17	1	0.07	0.12	1.07E-02
521	1	0.07	1	0.07	0.07	3.49E-03
522	2	0.13	2	0.13	0.13	1.40E-02
523	2	0.13	1.5	0.10	0.12	1.07E-02
524	1.5	0.10	1	0.07	0.08	5.46E-03
525	1	0.07	1	0.07	0.07	3.49E-03

PORE	MAX. DIA.	MAX. DIA.	MIN. DIA.	MIN. DIA.	AVE. DIA.	AREA
	(mm)	(μm)	(mm)	(μm)	(μm)	(μm)(μm)
526	2.5	0.17	2	0.13	0.15	1.77E-02
527	1.5	0.10	1.5	0.10	0.10	7.86E-03
528	1.5	0.10	1	0.07	0.08	5.46E-03
529	2	0.13	1.5	0.10	0.12	1.07E-02
530	2	0.13	1.5	0.10	0.12	1.07E-02
531	2.5	0.17	1.5	0.10	0.13	1.40E-02
532	4	0.27	2	0.13	0.20	3.14E-02
533	4	0.27	2.5	0.17	0.22	3.69E-02
534	3.5	0.23	1.5	0.10	0.17	2.18E-02
535	2.5	0.17	1.5	0.10	0.13	1.40E-02
536	2.5	0.17	1.5	0.10	0.13	1.40E-02
537	6	0.40	2	0.13	0.27	5.59E-02
538	2.5	0.17	2	0.13	0.15	1.77E-02
539	1.5	0.10	1.5	0.10	0.10	7.86E-03
540	3	0.20	1.5	0.10	0.15	1.77E-02
541	2	0.13	1.5	0.10	0.12	1.07E-02
542	2	0.13	2	0.13	0.13	1.40E-02
543	2.5	0.17	1.5	0.10	0.13	1.40E-02
544	3.5	0.23	1.5	0.10	0.17	2.18E-02
545	2.5	0.17	2	0.13	0.15	1.77E-02
546	2.5	0.17	2	0.13	0.15	1.77E-02
547	6	0.40	2	0.13	0.27	5.59E-02
548	4	0.27	3	0.20	0.23	4.28E-02
549	2	0.13	1	0.07	0.10	7.86E-03
550	1.5	0.10	1	0.07	0.08	5.46E-03
551	3.5	0.23	1	0.07	0.15	1.77E-02
552	3	0.20	2	0.13	0.17	2.18E-02
553	2.5	0.17	2	0.13	0.15	1.77E-02
554	2	0.13	2	0.13	0.13	1.40E-02
555	1.5	0.10	1.5	0.10	0.10	7.86E-03
556	3.5	0.23	1.5	0.10	0.17	2.18E-02
557	2	0.13	1	0.07	0.10	7.86E-03
558	3.5	0.23	1.5	0.10	0.17	2.18E-02
559	1.5	0.10	1	0.07	0.08	5.46E-03
560	2	0.13	1	0.07	0.10	7.86E-03
561	1.5	0.10	1	0.07	0.08	5.46E-03
562	2	0.13	1	0.07	0.10	7.86E-03
563	2	0.13	1.5	0.10	0.12	1.07E-02
564	2.5	0.17	1	0.07	0.12	1.07E-02
565	3	0.20	1	0.07	0.13	1.40E-02
566	3	0.20	2.5	0.17	0.18	2.64E-02

PORE	MAX. DIA.	MAX. DIA.	MIN. DIA.	MIN. DIA.	AVE. DIA.	AREA
	(mm)	(μm)	(mm)	(μm)	(μm)	(μm)(μm)
567	2.5	0.17	2.5	0.17	0.17	2.18E-02
568	2.5	0.17	1.5	0.10	0.13	1.40E-02
569	2.5	0.17	2	0.13	0.15	1.77E-02
570	1	0.07	1	0.07	0.07	3.49E-03
571	3.5	0.23	1.5	0.10	0.17	2.18E-02
572	3	0.20	1	0.07	0.13	1.40E-02
573	2	0.13	1.5	0.10	0.12	1.07E-02
574	1.5	0.10	1	0.07	0.08	5.46E-03
575	2.5	0.17	1.5	0.10	0.13	1.40E-02
576	3	0.20	1.5	0.10	0.15	1.77E-02
577	2.5	0.17	1.5	0.10	0.13	1.40E-02
578	3	0.20	1.5	0.10	0.15	1.77E-02
579	2	0.13	2	0.13	0.13	1.40E-02
580	2	0.13	1	0.07	0.10	7.86E-03
581	3	0.20	1.5	0.10	0.15	1.77E-02
582	2.5	0.17	2	0.13	0.15	1.77E-02
583	2	0.13	1.5	0.10	0.12	1.07E-02
584	3	0.20	2	0.13	0.17	2.18E-02
585	3	0.20	1.5	0.10	0.15	1.77E-02
586	4	0.27	2	0.13	0.20	3.14E-02
587	5	0.33	1.5	0.10	0.22	3.69E-02
588	5	0.33	1.5	0.10	0.22	3.69E-02
589	3.5	0.23	2.5	0.17	0.20	3.14E-02
590	2	0.13	1	0.07	0.10	7.86E-03
591	2.5	0.17	1	0.07	0.12	1.07E-02
592	3	0.20	2	0.13	0.17	2.18E-02
593	1.5	0.10	1	0.07	0.08	5.46E-03
594	2	0.13	1.5	0.10	0.12	1.07E-02
595	2	0.13	1.5	0.10	0.12	1.07E-02
596	3	0.20	1	0.07	0.13	1.40E-02
597	3	0.20	1.5	0.10	0.15	1.77E-02
598	3	0.20	2	0.13	0.17	2.18E-02
599	2	0.13	1.5	0.10	0.12	1.07E-02
600	1.5	0.10	1	0.07	0.08	5.46E-03
601	2.5	0.17	1	0.07	0.12	1.07E-02
602	2	0.13	1.5	0.10	0.12	1.07E-02
603	2.5	0.17	1.5	0.10	0.13	1.40E-02
604	2	0.13	1	0.07	0.10	7.86E-03
605	1.5	0.10	1	0.07	0.08	5.46E-03
606	2.5	0.17	1.5	0.10	0.13	1.40E-02
607	2.5	0.17	1	0.07	0.12	1.07E-02

PORE	MAX. DIA.	MAX. DIA.	MIN. DIA.	MIN. DIA.	AVE. DIA.	AREA
	(mm)	(μm)	(mm)	(μm)	(μm)	(μm)(μm)
608	3	0.20	2	0.13	0.17	2.18E-02
609	2.5	0.17	1.5	0.10	0.13	1.40E-02
610	2	0.13	1	0.07	0.10	7.86E-03
611	2	0.13	2	0.13	0.13	1.40E-02
612	2.5	0.17	2	0.13	0.15	1.77E-02
613	2.5	0.17	1.5	0.10	0.13	1.40E-02
614	3	0.20	2	0.13	0.17	2.18E-02
615	1.5	0.10	1	0.07	0.08	5.46E-03
616	3	0.20	1	0.07	0.13	1.40E-02
617	2	0.13	1	0.07	0.10	7.86E-03
618	1.5	0.10	1.5	0.10	0.10	7.86E-03
619	2	0.13	2	0.13	0.13	1.40E-02
620	4	0.27	1.5	0.10	0.18	2.64E-02
621	2	0.13	1	0.07	0.10	7.86E-03
622	2	0.13	1.5	0.10	0.12	1.07E-02
623	5.5	0.37	2	0.13	0.25	4.91E-02
624	4	0.27	1.5	0.10	0.18	2.64E-02
625	2	0.13	1.5	0.10	0.12	1.07E-02
626	2	0.13	1.5	0.10	0.12	1.07E-02
627	2	0.13	1	0.07	0.10	7.86E-03
628	2.5	0.17	2	0.13	0.15	1.77E-02
629	3	0.20	0.5	0.03	0.12	1.07E-02
630	4	0.27	2	0.13	0.20	3.14E-02
631	3.5	0.23	1.5	0.10	0.17	2.18E-02
632	2	0.13	1	0.07	0.10	7.86E-03
633	1.5	0.10	1	0.07	0.08	5.46E-03
634	2	0.13	1	0.07	0.10	7.86E-03
635	2	0.13	1	0.07	0.10	7.86E-03
636	1.5	0.10	1	0.07	0.08	5.46E-03
637	2	0.13	1	0.07	0.10	7.86E-03
638	2	0.13	1.5	0.10	0.12	1.07E-02
639	3	0.20	1.5	0.10	0.15	1.77E-02
640	6	0.40	1.5	0.10	0.25	4.91E-02
641	4	0.27	2.5	0.17	0.22	3.69E-02
642	1	0.07	1	0.07	0.07	3.49E-03
643	4	0.27	2.5	0.17	0.22	3.69E-02
644	3	0.20	1	0.07	0.13	1.40E-02
645	2	0.13	1	0.07	0.10	7.86E-03
646	3.5	0.23	2	0.13	0.18	2.64E-02
647	3.5	0.23	1	0.07	0.15	1.77E-02
648	2.5	0.17	2	0.13	0.15	1.77E-02

PORE	MAX. DIA. (mm)	MAX. DIA. (μm)	MIN. DIA. (mm)	MIN. DIA. (μm)	AVE. DIA. (μm)	AREA (μm)(μm)
649	1.5	0.10	1	0.07	0.08	5.46E-03
650	1.5	0.10	1	0.07	0.08	5.46E-03
651	5	0.33	3	0.20	0.27	5.59E-02
652	1.5	0.10	1.5	0.10	0.10	7.86E-03
653	3	0.20	2.5	0.17	0.18	2.64E-02
654	2	0.13	1	0.07	0.10	7.86E-03
655	1.5	0.10	1	0.07	0.08	5.46E-03
656	3	0.20	1.5	0.10	0.15	1.77E-02
657	3	0.20	1.5	0.10	0.15	1.77E-02
658	2	0.13	1	0.07	0.10	7.86E-03
659	2.5	0.17	1	0.07	0.12	1.07E-02
660	2	0.13	1.5	0.10	0.12	1.07E-02
661	4	0.27	1.5	0.10	0.18	2.64E-02
662	4	0.27	1.5	0.10	0.18	2.64E-02
663	2.5	0.17	2.5	0.17	0.17	2.18E-02
664	4	0.27	2.5	0.17	0.22	3.69E-02
665	4.5	0.30	2	0.13	0.22	3.69E-02
666	6	0.40	1.5	0.10	0.25	4.91E-02
667	3	0.20	2	0.13	0.17	2.18E-02
668	2	0.13	2	0.13	0.13	1.40E-02
669	3	0.20	2	0.13	0.17	2.18E-02
670	2	0.13	1	0.07	0.10	7.86E-03
671	2.5	0.17	1.5	0.10	0.13	1.40E-02
672	2.5	0.17	2	0.13	0.15	1.77E-02
673	5.5	0.37	1.5	0.10	0.23	4.28E-02
674	2.5	0.17	2	0.13	0.15	1.77E-02
675	2.5	0.17	1.5	0.10	0.13	1.40E-02
676	2	0.13	0.5	0.03	0.08	5.46E-03
677	2.5	0.17	1.5	0.10	0.13	1.40E-02
678	2.5	0.17	2	0.13	0.15	1.77E-02
679	4.5	0.30	2	0.13	0.22	3.69E-02
680	3	0.20	2	0.13	0.17	2.18E-02
681	1.5	0.10	1.5	0.10	0.10	7.86E-03
682	1.5	0.10	1.5	0.10	0.10	7.86E-03
683	2	0.13	1	0.07	0.10	7.86E-03
684	2	0.13	1.5	0.10	0.12	1.07E-02
685	1.5	0.10	0.5	0.03	0.07	3.49E-03
686	1.5	0.10	1	0.07	0.08	5.46E-03
687	2	0.13	2	0.13	0.13	1.40E-02
688	2	0.13	1.5	0.10	0.12	1.07E-02
689	3	0.20	1.5	0.10	0.15	1.77E-02

PORE	MAX. DIA.	MAX. DIA.	MIN. DIA.	MIN. DIA.	AVE. DIA.	AREA
	(mm)	(μm)	(mm)	(μm)	(μm)	(μm)(μm)
690	2.5	0.17	1.5	0.10	0.13	1.40E-02
691	2.5	0.17	1.5	0.10	0.13	1.40E-02
692	2	0.13	1	0.07	0.10	7.86E-03
693	2	0.13	2	0.13	0.13	1.40E-02
694	2	0.13	1.5	0.10	0.12	1.07E-02
695	1.5	0.10	1	0.07	0.08	5.46E-03
696	2	0.13	2	0.13	0.13	1.40E-02
AVE	2.53	0.17	1.49	0.10	0.13	1.08E+01
STD. DEV.		0.06		0.03		