

GEORGIA INSTITUTE OF TECHNOLOGY
OFFICE OF CONTRACT ADMINISTRATION

(10)

NOTICE OF PROJECT CLOSEOUT

209 14

Closeout Notice Date 10/27/95

Project No. E-18-X01 _____ Center No. 10/24-6-R8155-0A0_

Project Director THADHANI N N _____ School/Lab MSE _____

Sponsor SANDIA NAT'L LABS/WESTERN ELECTRIC CO INC _____

Contract/Grant No. AK-4947 _____ Contract Entity GTRC

Prime Contract No. DE-AC04-94AL85000 _____

Title MICROSTRUCTURAL CHARACTERIZATION OF PRE-SHOCKED & POST-SHOCKED POWDER ...

Effective Completion Date 950930 (Performance) 950930 (Reports)

Closeout Actions Required:	Y/N	Date Submitted
Final Invoice or Copy of Final Invoice	Y	_____
Final Report of Inventions and/or Subcontracts	N	_____
Government Property Inventory & Related Certificate	Y	_____
Classified Material Certificate	N	_____
Release and Assignment	Y	_____
Other _____	N	_____
Comments _____		

Subproject Under Main Project No. _____

Continues Project No. _____

Distribution Required:

Project Director	Y
Administrative Network Representative	Y
GTRI Accounting/Grants and Contracts	Y
Procurement/Supply Services	Y
Research Property Management	Y
Research Security Services	N
Reports Coordinator (UCA)	Y
GTRC	Y
Project File	Y
Other _____	N
_____	N

E-18-X01 (new)

Contracting Organization 10232

MONTHLY COST STATUS REPORT

Contract No. AK-4947

Mr. Frank Lujan
Sandia Contracting Representative

Period Ending (1) 7-30-94

Contractor must forecast, as a minimum, through the Period of Performance, when costs will be incurred in these months.
Contractor must forward this report to reach the Sandia Contracting Representative no later than the 10th of the month following the Report Period
or such other time as requested by the Sandia Contracting Representative.

Total Funds Authorized	\$ <u>25,000</u>
Existing Limitation of Obligation (2)	<u>25,000</u>
Actual Cost Incurred to Date (3)	<u>-0-</u>

Estimated Cost to Complete: (4)

Month following Period Ending" specified above	Aug. <u>\$1,923.08</u>	13th Month	Aug. <u>1,923.07</u>
2nd Month	Sept. <u>1,923.08</u>	14th Month	<u> </u>
3rd Month	Oct. <u>1,923.08</u>	15th Month	<u> </u>
4th Month	Nov. <u>1,923.08</u>	16th Month	<u> </u>
5th Month	Dec. <u>1,923.08</u>	17th Month	<u> </u>
6th Month	Jan. <u>1,923.08</u>	18th Month	<u> </u>
7th Month	Feb. <u>1,923.08</u>	19th Month	<u> </u>
8th Month	Mar. <u>1,923.08</u>	20th Month	<u> </u>
9th Month	Apr. <u>1,923.08</u>	21st Month	<u> </u>
10th Month	May <u>1,923.07</u>	22nd Month	<u> </u>
11th Month	June <u>1,923.07</u>	23rd Month	<u> </u>
12th Month	July <u>1,923.07</u>	Remaining Balance (5)	<u> </u>

Total Estimate to Complete	<u>25,000</u>
Total Estimated Cost at Completion	\$ <u>25,000</u>

Notes:
1. Forecast full month for which actual costs are available.
2. Do not forecast beyond Limitation of Obligation, if one exists. Any amount over the Limitation of Obligation, which is anticipated to be future cost, should be included in "Remaining Balance."
3. Forecast includes applicable fee.
4. Estimates for costs to be incurred (Do not include commitments), including applicable fee.
5. Remaining balance includes any forecasts beyond the specified months above and any amounts beyond the Limitation of Obligation.

Contractor: Georgia Tech Research Corporation

Address: Office of Contract Administration
Centennial Research Building
Atlanta, GA 30332-0420

David Welch Signed
Director, Grants & Contracts Acctg.
Title
Phone: (404) 894-2629
Date: 11/10/94

Albuquerque, New Mexico 87186-5800
Livermore, California 94551-0869

Contracting Organization _____

MONTHLY COST STATUS REPORT

Contract No. AK-4547

Period Ending (1) 8-31-94

Sandis Contracting Representative

Contractor must forecast, as a minimum, through the Period of Performance, when costs will be incurred in these months.
Contractor must forward this report to reach the Sandis Contracting Representative no later than the 10th of the month following the Report Period
or such other time as requested by the Sandis Contracting Representative.

Total Funds Authorized	\$ <u>25,000.00</u>
Existing Limitation of Obligation (2)	<u>25,000.00</u>
Actual Cost Incurred to Date (3)	<u>795.76</u>

Estimated Cost to Complete: (4)

Month following Period Ending" specified above	<u>24,204.24</u>	13th Month	_____
2nd Month	_____	14th Month	_____
3rd Month	_____	15th Month	_____
4th Month	_____	16th Month	_____
5th Month	_____	17th Month	_____
6th Month	_____	18th Month	_____
7th Month	_____	19th Month	_____
8th Month	_____	20th Month	_____
9th Month	_____	21st Month	_____
10th Month	_____	22nd Month	_____
11th Month	_____	23rd Month	_____
12th Month	_____	Remaining Balance (5)	_____

Total Estimate to Complete	<u>25,000.00</u>
Total Estimated Cost at Completion	\$ <u>25,000.00</u>

NOTES:

Last full month for which actual costs are available.
Do not forecast beyond Limitation of Obligation, if one exists. Any amount over the Limitation of Obligation, which is anticipated to be a future cost, should be included in "Remaining Balance."
Cost includes applicable fee.
Estimates for costs to be incurred (Do not include commitments), including applicable fee.
Remaining balance includes any forecasts beyond the specified months above and any amounts beyond the Limitation of Obligation.

Contractor:
Address:

 Signed
Accountant II
 Title
 Phone: (404) 894-5546
 Date: 9-10-94

Housing Organization _____

MONTHLY COST STATUS REPORT

Contract No. AK-4947

Period Ending (1) 9-30-94

Sandia Contracting Representative

Contractor must forecast, as a minimum, through the Period of Performance, when costs will be incurred in these months. Contractor must forward this report to reach the Sandia Contracting Representative no later than the 10th of the month following the Report Period such other time as requested by the Sandia Contracting Representative.

Total Funds Authorized	\$ <u>25,000.00</u>
Existing Limitation of Obligation (2)	<u>25,000.00</u>
Actual Cost Incurred to Date (3)	<u>7,770.14</u>

Estimated Cost to Complete: (4)

Month following Period Ending* defined above	<u>1914.43</u>
2nd Month	<u>1914.43</u>
3rd Month	<u>1914.43</u>
4th Month	<u>1914.43</u>
5th Month	<u>1914.43</u>
6th Month	<u>1914.43</u>
7th Month	<u>1914.43</u>
8th Month	<u>1914.43</u>
9th Month	<u>1914.43</u>
10th Month	<u>1914.43</u>
11th Month	<u>1914.43</u>
12th Month	<u>1914.43</u>
13th Month	<u>1914.43</u>
14th Month	<u>1914.43</u>
15th Month	<u>1914.43</u>
16th Month	<u>1914.43</u>
17th Month	<u>1914.43</u>
18th Month	<u>1914.43</u>
19th Month	<u>1914.43</u>
20th Month	<u>1914.43</u>
21st Month	<u>1914.43</u>
22nd Month	<u>1914.43</u>
23rd Month	<u>1914.43</u>
Remaining Balance (5)	<u>1914.43</u>

13th Month	_____
14th Month	_____
15th Month	_____
16th Month	_____
17th Month	_____
18th Month	_____
19th Month	_____
20th Month	_____
21st Month	_____
22nd Month	_____
23rd Month	_____
Remaining Balance (5)	_____

Total Estimate to Complete	_____
Total Estimated Cost at Completion	\$ <u>25,000.00</u>

Notes:

* At full month for which actual costs are available.

† Not forecast beyond Limitation of Obligation, if one exists. Any amount over the Limitation of Obligation, which is anticipated to be future cost, should be included in "Remaining Balance."

‡ Includes applicable fee.

§ Estimates for costs to be incurred (Do not include commitments), including applicable fee.

¶ Remaining balance includes any forecasts beyond the specified months above and any amounts beyond the Limitation of Obligation.

FOR:
BY:

Signed _____
Accountant II
 This
 Phone: (404) 894-9566
 Date: 10/12/94

Issuing Organization 10232

MONTHLY COST STATUS REPORT

Contract No. AK-4947

Mr. Frank Lujan
Sandia Contracting Representative

Period Ending (1) 10-31-94

Contractor must forecast, as a minimum, through the Period of Performance, when costs will be incurred in these months.
Contractor must forward this report to reach the Sandia Contracting Representative no later than the 10th of the month following the Report Period
or at other times as requested by the Sandia Contracting Representative.

Total Funds Authorized	\$ <u>25,000.00</u>
Existing Limitation of Obligation (2)	<u>25,000.00</u>
Actual Cost Incurred to Date (3)	<u>8,999.87</u>

Estimated Cost to Complete: (4)

Month following Ending		
Month above Nov.	<u>\$1,454.56</u>	13th Month <u> </u>
Month Dec.	<u>1,454.56</u>	14th Month <u> </u>
Month Jan.	<u>1,454.56</u>	15th Month <u> </u>
Month Feb.	<u>1,454.56</u>	16th Month <u> </u>
Month Mar.	<u>1,454.56</u>	17th Month <u> </u>
Month Apr.	<u>1,454.56</u>	18th Month <u> </u>
Month May	<u>1,454.56</u>	19th Month <u> </u>
Month June	<u>1,454.56</u>	20th Month <u> </u>
Month July	<u>1,454.55</u>	21st Month <u> </u>
Month Aug.	<u>1,454.55</u>	22nd Month <u> </u>
Month Sept.	<u>1,454.55</u>	23rd Month <u> </u>
Month		Remaining Balance (5) <u> </u>

Total Estimate to Complete	<u>16,000.13</u>
Total Estimated Cost at Completion	\$ <u>25,000.00</u>

Forecast for full month for which actual costs are available.
Forecast beyond Limitation of Obligation, if one exists. Any amount over the Limitation of Obligation, which is anticipated to be incurred cost, should be included in "Remaining Balance."
Includes applicable fee.
Forecast for costs to be incurred (Do not include commitments), including applicable fee.
Remaining balance includes any forecasts beyond the specified months above and any amounts beyond the Limitation of Obligation.

to: Georgia Tech Research Corporation
Office of Contract Administration
Attn: C. D'Ubrano
Centennial Research Building
Atlanta, GA 30332-0420

David Welch Signed
Director, Grants & Contracts Acctg.
Title

Phone (404) 894-2629

Date 11/10/94

leasing Organization 10232

E18X01

MONTHLY COST STATUS REPORT

Contract No. AK-4947

Mr. Frank Lujan
 Sandia Contracting Representative

Period Ending (1) 11/30/94

Contractor must forecast, as a minimum, through the Period of Performance, when costs will be incurred in these months.
 Contractor must forward this report to reach the Sandia Contracting Representative no later than the 10th of the month following the Report Period
 or such other time as requested by the Sandia Contracting Representative.

Total Funds Authorized	\$ <u>25,000.00</u>
Existing Limitation of Obligation (2)	<u>25,000.00</u>
Actual Cost Incurred to Date (3)	<u>8,999.87</u>

Estimated Cost to Complete: (4)

Month following Period Ending specified above	<u>1600.01</u>	13th Month	_____
2nd Month	<u>1600.01</u>	14th Month	_____
3rd Month	<u>1600.01</u>	15th Month	_____
4th Month	<u>1600.01</u>	16th Month	_____
5th Month	<u>1600.01</u>	17th Month	_____
6th Month	<u>1600.01</u>	18th Month	_____
7th Month	<u>1600.01</u>	19th Month	_____
8th Month	<u>1600.01</u>	20th Month	_____
9th Month	<u>1600.01</u>	21st Month	_____
10th Month	<u>1600.04</u>	22nd Month	_____
11th Month	_____	23rd Month	_____
12th Month	_____	Remaining Balance (5)	_____

Total Estimate to Complete	<u>16000.13</u>
Total Estimated Cost at Completion	\$ <u>25,000.00</u>

FES:

Last full month for which actual costs are available.
 Do not forecast beyond Limitation of Obligation, if one exists. Any amount over the Limitation of Obligation, which is anticipated to be a future cost, should be included in "Remaining Balance."
 Cost includes applicable fee.
 Estimates for costs to be incurred (Do not include commitments), including applicable fee.
 Remaining balance includes any forecasts beyond the specified months above and any amounts beyond the Limitation of Obligation.

Contractor: Georgia Tech Research Corporation
 Address: Office of Contract Administration
 Attn: C. D'Urbano
 Centennial Research Building
 Atlanta, GA 30332

 Signed
 David L. Moore Accountant II
 Title
 Phone: (404) 894-5791
 Date: _____

E 18 X 01

Contracting Organization 10232

MONTHLY COST STATUS REPORT

Contract No. AK-4947

Mr. Frank Lujan
 Sandia Contracting Representative

Period Ending (1) 12/31/94

Contractor must forecast, as a minimum, through the Period of Performance, when costs will be incurred in these months.
 Contractor must forward this report to reach the Sandia Contracting Representative no later than the 10th of the month following the Report Period
 such other time as requested by the Sandia Contracting Representative.

Total Funds Authorized	\$ <u>25,000.00</u>
Existing Limitation of Obligation (2)	<u>25,000.00</u>
Actual Cost Incurred to Date (3)	<u>8,999.87</u>

Estimated Cost to Complete: (4)

Month following Period Ending* Forecasted above	<u>1777.79</u>	13th Month	_____
2nd Month	<u>1777.79</u>	14th Month	_____
3rd Month	<u>1777.79</u>	15th Month	_____
4th Month	<u>1777.79</u>	16th Month	_____
5th Month	<u>1777.79</u>	17th Month	_____
6th Month	<u>1777.79</u>	18th Month	_____
7th Month	<u>1777.79</u>	19th Month	_____
8th Month	<u>1777.79</u>	20th Month	_____
9th Month	<u>1777.81</u>	21st Month	_____
10th Month	_____	22nd Month	_____
11th Month	_____	23rd Month	_____
12th Month	_____	Remaining Balance (5)	_____

Total Estimate to Complete	<u>16000.13</u>
Total Estimated Cost at Completion	\$ <u>25,000.00</u>

NOTES:
 *Last full month for which actual costs are available.
 Do not forecast beyond Limitation of Obligation, if one exists. Any amount over the Limitation of Obligation, which is anticipated to be a future cost, should be included in "Remaining Balance."
 Cost includes applicable fee.
 Estimates for costs to be incurred (Do not include commitments), including applicable fee.
 Remaining balance includes any forecasts beyond the specified months above and any amounts beyond the Limitation of Obligation.

Contractor: Georgia Tech Research Corporation
 Address: Office of Contract Administration
 Attn: C. D'Urbano
 Centennial Research Building
 Atlanta, GA 30332

 Signed
 David L. Moore Accountant II
 Title
 Phone: (404) 894-5791
 Date: _____

E18698/Thadhani, MSE

Albuquerque, New Mexico 87185-6800
Livermore, California 94551-0969

Contracting Organization 10232

MONTHLY COST STATUS REPORT

Contract No. AK-4947

Mr. Frank Lujan

Period Ending (1) 1/31/95

Sandia Contracting Representative

Contractor must forecast, as a minimum, through the Period of Performance, when costs will be incurred in these months.
Contractor must forward this report to reach the Sandia Contracting Representative no later than the 10th of the month following the Report Period
such other time as requested by the Sandia Contracting Representative.

Total Funds Authorized	\$ <u>25,000.00</u>
Existing Limitation of Obligation (2)	<u>25,000.00</u>
Actual Cost Incurred to Date (3)	<u>10,761.93</u>

Estimated Cost to Complete: (4)

Month following Period Ending* specified above	<u>1779.76</u>	13th Month	_____
2nd Month	<u>1779.76</u>	14th Month	_____
3rd Month	<u>1779.76</u>	15th Month	_____
4th Month	<u>1779.76</u>	16th Month	_____
5th Month	<u>1779.76</u>	17th Month	_____
6th Month	<u>1779.76</u>	18th Month	_____
7th Month	<u>1779.76</u>	19th Month	_____
8th Month	<u>1779.75</u>	20th Month	_____
9th Month	_____	21st Month	_____
10th Month	_____	22nd Month	_____
11th Month	_____	23rd Month	_____
12th Month	_____	Remaining Balance (5)	_____

Total Estimate to Complete	<u>14,238.07</u>
Total Estimated Cost at Completion	\$ <u>25,000.00</u>

ES:
Forecast full month for which actual costs are available.
Do not forecast beyond Limitation of Obligation, if one exists. Any amount over the Limitation of Obligation, which is anticipated to be a future cost, should be included in "Remaining Balance."
Cost includes applicable fee.
Estimates for costs to be incurred (Do not include commitments), including applicable fee.
Remaining balance includes any forecasts beyond the specified months above and any amounts beyond the Limitation of Obligation.

Contractor: Georgia Tech Research Corporation
Address: Office of Contract Administration
Attn: C. D'Urbano
Centennial Research Building
Atlanta, GA 30332

Signed
David L. Moore Accountant II
Title
Phone: (404) 894-5791
Date: 2/16/95

2-CS (8-92)
XC: Thadhani, MSE
MOORE
Welch (Extra Copy)
File (12)

Purchasing Organization 10232

E18X01

MONTHLY COST STATUS REPORT

Contract No. AK-4947

Mr. Frank Lujan

Period Ending (1) 1/31/95

Sandia Contracting Representative

Contractor must forecast, as a minimum, through the Period of Performance, when costs will be incurred in these months. Contractor must forward this report to reach the Sandia Contracting Representative no later than the 10th of the month following the Report Period or at such other time as requested by the Sandia Contracting Representative.

Total Funds Authorized	\$ <u>25,000.00</u>
Existing Limitation of Obligation (2)	<u>25,000.00</u>
Actual Cost Incurred to Date (3)	<u>10,761.93</u>

Estimated Cost to Complete: (4)

1st Month following Period Ending* Specified above	<u>1779.76</u>	13th Month	_____
2nd Month	<u>1779.76</u>	14th Month	_____
3rd Month	<u>1779.76</u>	15th Month	_____
4th Month	<u>1779.76</u>	16th Month	_____
5th Month	<u>1779.76</u>	17th Month	_____
6th Month	<u>1779.76</u>	18th Month	_____
7th Month	<u>1779.76</u>	19th Month	_____
8th Month	<u>1779.75</u>	20th Month	_____
9th Month	_____	21st Month	_____
10th Month	_____	22nd Month	_____
11th Month	_____	23rd Month	_____
12th Month	_____	Remaining Balance (5)	_____

Total Estimate to Complete	<u>14238.07</u>
Total Estimated Cost at Completion	\$ <u>25,000.00</u>

NOTES:

- 1) Last full month for which actual costs are available.
- 2) Do not forecast beyond Limitation of Obligation, if one exists. Any amount over the Limitation of Obligation, which is anticipated to be a future cost, should be included in "Remaining Balance."
- 3) Cost includes applicable fee.
- 4) Estimates for costs to be incurred (Do not include commitments), including applicable fee.
- 5) Remaining balance includes any forecasts beyond the specified months above and any amounts beyond the Limitation of Obligation.

Contractor: Georgia Tech Research Corporation
 Address: Office of Contract Administration
 Attn: C. D'Urbano
 Centennial Research Building
 Atlanta, GA 30332

 Signed
 David L. Moore Accountant II
 Title
 Phone: (404) 894-5791
 Date: _____

E18Xc1

Ordering Organization 10232

MONTHLY COST STATUS REPORT

Contract No. AK-4947

Mr. Frank Lujan
Sandia Contracting Representative

Period Ending (1) 2/28/95

Contractor must forecast, as a minimum, through the Period of Performance, when costs will be incurred in these months.
Contractor must forward this report to reach the Sandia Contracting Representative no later than the 10th of the month following the Report Period
or such other time as requested by the Sandia Contracting Representative.

Total Funds Authorized	\$ <u>25,000.00</u>
Existing Limitation of Obligation (2)	<u>25,000.00</u>
Actual Cost Incurred to Date (3)	<u>11,349.93</u>

Estimated Cost to Complete: (4)

Month following Period Ending* specified above	<u>1950.01</u>	13th Month	<u> </u>
2nd Month	<u>1950.01</u>	14th Month	<u> </u>
3rd Month	<u>1950.01</u>	15th Month	<u> </u>
4th Month	<u>1950.01</u>	16th Month	<u> </u>
5th Month	<u>1950.01</u>	17th Month	<u> </u>
6th Month	<u>1950.01</u>	18th Month	<u> </u>
7th Month	<u>1950.01</u>	19th Month	<u> </u>
8th Month	<u> </u>	20th Month	<u> </u>
9th Month	<u> </u>	21st Month	<u> </u>
10th Month	<u> </u>	22nd Month	<u> </u>
11th Month	<u> </u>	23rd Month	<u> </u>
12th Month	<u> </u>	Remaining Balance (5)	<u> </u>

Total Estimate to Complete	<u>13,650.07</u>
Total Estimated Cost at Completion	\$ <u>25,000.00</u>

NOTES:

1. Last full month for which actual costs are available.

2. Do not forecast beyond Limitation of Obligation, if one exists. Any amount over the Limitation of Obligation, which is anticipated to be a future cost, should be included in "Remaining Balance."

3. Cost includes applicable fee.

4. Estimates for costs to be incurred (Do not include commitments), including applicable fee.

5. Remaining balance includes any forecasts beyond the specified months above and any amounts beyond the Limitation of Obligation.

Contractor: Georgia Tech Research Corporation
 Address: Office of Contract Administration
 Attn: C. D'Urbano
 Centennial Research Building
 Atlanta, GA 30332

Signed

David L. Moore Accountant II
 Title
 Phone: (404) 894-5791
 Date: _____

Contracting Organization 10232

MONTHLY COST STATUS REPORT

Contract No. AK-4947

Mr. Frank Lujan
 Sandia Contracting Representative

Period Ending (1) 4/30/95

Contractor must forecast, as a minimum, through the Period of Performance, when costs will be incurred in these months.
 Contractor must forward this report to reach the Sandia Contracting Representative no later than the 10th of the month following the Report Period
 each other time as requested by the Sandia Contracting Representative.

Total Funds Authorized	\$	<u>25,000.00</u>
Existing Limitation of Obligation (2)		<u>25,000.00</u>
Actual Cost Incurred to Date (3)		<u>13,673.21</u>

Estimated Cost to Complete: (4)

Month following Period Ending" ended above	<u>2265.36</u>	13th Month	
1st Month	<u>2265.36</u>	14th Month	
2nd Month	<u>2265.36</u>	15th Month	
3rd Month	<u>2265.36</u>	16th Month	
4th Month	<u>2265.35</u>	17th Month	
5th Month		18th Month	
6th Month		19th Month	
7th Month		20th Month	
8th Month		21st Month	
9th Month		22nd Month	
10th Month		23rd Month	
		Remaining Balance (5)	

Total Estimate to Complete		<u>11,326.79</u>
Total Estimated Cost at Completion	\$	<u>25,000.00</u>

Notes:
 1. Last full month for which actual costs are available.
 2. Do not forecast beyond Limitation of Obligation, if one exists. Any amount over the Limitation of Obligation, which is anticipated to be future cost, should be included in "Remaining Balance."
 3. Cost includes applicable fee.
 4. Estimates for costs to be incurred (Do not include commitments), including applicable fee.
 5. Remaining balance includes any forecasts beyond the specified months above and any amounts beyond the Limitation of Obligation.

Contractor: Georgia Tech Research Corporation
 Address: Office of Contract Administration
 Attn: C. D'Urbano
 Centennial Research Building
 Atlanta, GA 30332

 Signed
 David L. Moore Accountant II
 Title
 Phone: (404) 894-5791
 Date: 5/17/95

Purchasing Organization 10232

MONTHLY COST STATUS REPORT

Contract No. AK-4947

Mr. Frank Lujan
 Sandia Contracting Representative

Period Ending (1) 5/31/95

Contractor must forecast, as a minimum, through the Period of Performance, when costs will be incurred in these months.
 Contractor must forward this report to reach the Sandia Contracting Representative no later than the 10th of the month following the Report Period
 at such other time as requested by the Sandia Contracting Representative.

Total Funds Authorized	\$	<u>25,000.00</u>
Existing Limitation of Obligation (2)		<u>25,000.00</u>
Actual Cost Incurred to Date (3)		<u>14,423.76</u>

Estimated Cost to Complete: (4)

1st Month following Period Ending* Specified above	<u>2644.06</u>	13th Month	
2nd Month	<u>2644.06</u>	14th Month	
3rd Month	<u>2644.06</u>	15th Month	
4th Month	<u>2644.06</u>	16th Month	
5th Month		17th Month	
6th Month		18th Month	
7th Month		19th Month	
8th Month		20th Month	
9th Month		21st Month	
10th Month		22nd Month	
11th Month		23rd Month	
12th Month		Remaining Balance (5)	

Total Estimate to Complete		<u>10,576.24</u>
Total Estimated Cost at Completion	\$	<u>25,000.00</u>

- NOTES:**
- 1) Last full month for which actual costs are available.
 - 2) Do not forecast beyond Limitation of Obligation, if one exists. Any amount over the Limitation of Obligation, which is anticipated to be a future cost, should be included in "Remaining Balance."
 - 3) Cost includes applicable fee.
 - 4) Estimates for costs to be incurred (Do not include commitments), including applicable fee.
 - 5) Remaining balance includes any forecasts beyond the specified months above and any amounts beyond the Limitation of Obligation.

Contractor: Georgia Tech Research Corporation
 Address: Office of Contract Administration
 Attn: C. D'Urbano
 Centennial Research Building
 Atlanta, GA 30332

 Signed
 David L. Moore Accountant II
 Title
 Phone: (404) 894-5791
 Date: _____

Purchasing Organization 10232

MONTHLY COST STATUS REPORT

Contract No. AK-4947

Mr. Frank Lujan
 Sandia Contracting Representative

Period Ending (1) 6/30/95

Contractor must forecast, as a minimum, through the Period of Performance, when costs will be incurred in these months.
 Contractor must forward this report to reach the Sandia Contracting Representative no later than the 10th of the month following the Report Period
 such other time as requested by the Sandia Contracting Representative.

Total Funds Authorized	\$ <u>25,000.00</u>
Existing Limitation of Obligation (2)	<u>25,000.00</u>
Actual Cost Incurred to Date (3)	<u>16,250.95</u>

Estimated Cost to Complete: (4)

Month following Period Ending* Estimated above	<u>2,916.35</u>	13th Month	_____
2nd Month	<u>2,916.35</u>	14th Month	_____
3rd Month	<u>2,916.15</u>	15th Month	_____
4th Month	_____	16th Month	_____
5th Month	_____	17th Month	_____
6th Month	_____	18th Month	_____
7th Month	_____	19th Month	_____
8th Month	_____	20th Month	_____
9th Month	_____	21st Month	_____
10th Month	_____	22nd Month	_____
11th Month	_____	23rd Month	_____
12th Month	_____	Remaining Balance (5)	_____

Total Estimate to Complete	<u>8,749.05</u>
Total Estimated Cost at Completion	\$ <u>25,000.00</u>

NOTES:

- 1. Last full month for which actual costs are available.
- 2. Do not forecast beyond Limitation of Obligation, if one exists. Any amount over the Limitation of Obligation, which is anticipated to be a future cost, should be included in "Remaining Balance."
- 3. Cost includes applicable fee.
- 4. Estimates for costs to be incurred (Do not include commitments), including applicable fee.
- 5. Remaining balance includes any forecasts beyond the specified months above and any amounts beyond the Limitation of Obligation.

Contractor: Georgia Tech Research Corporation
 Address: Office of Contract Administration
 Attn: C. D'Urbano
 Centennial Research Building
 Atlanta, GA 30332

 Signed
 David L. Moore Accountant II
 Title
 Phone: (404) 894-5791
 Date: 7/26/95

leasing Organization 10232

MONTHLY COST STATUS REPORT

Contract No. AK-4947

Mr. Frank Lujan
Sandia Contracting Representative

Period Ending (1) 7/31/95

Contractor must forecast, as a minimum, through the Period of Performance, when costs will be incurred in these months.
Contractor must forward this report to reach the Sandia Contracting Representative no later than the 10th of the month following the Report Period
such other time as requested by the Sandia Contracting Representative.

Total Funds Authorized	\$ <u>25,000.00</u>
Existing Limitation of Obligation (2)	<u>25,000.00</u>
Actual Cost Incurred to Date (3)	<u>20,070.48</u>

Estimated Cost to Complete: (4)

Month following Period Ending specified above	<u>2,464.76</u>	13th Month	_____
2nd Month	<u>2,464.76</u>	14th Month	_____
3rd Month	_____	15th Month	_____
4th Month	_____	16th Month	_____
5th Month	_____	17th Month	_____
6th Month	_____	18th Month	_____
7th Month	_____	19th Month	_____
8th Month	_____	20th Month	_____
9th Month	_____	21st Month	_____
10th Month	_____	22nd Month	_____
11th Month	_____	23rd Month	_____
12th Month	_____	Remaining Balance (5)	_____

Total Estimate to Complete	<u>4,929.52</u>
Total Estimated Cost at Completion	\$ <u>25,000.00</u>

NOTES:

- 1. Last full month for which actual costs are available.
- 2. Do not forecast beyond Limitation of Obligation, if one exists. Any amount over the Limitation of Obligation, which is anticipated to be a future cost, should be included in "Remaining Balance."
- 3. Cost includes applicable fee.
- 4. Estimates for costs to be incurred (Do not include commitments), including applicable fee.
- 5. Remaining balance includes any forecasts beyond the specified months above and any amounts beyond the Limitation of Obligation.

Contractor: Georgia Tech Research Corporation
 Address: Office of Contract Administration
 Attn: C. D'Urbano
 Centennial Research Building
 Atlanta, GA 30332

Signed

David L. Moore Accountant II
 Title

Phone: (404) 894-5791

Date: 8/21/95

Contracting Organization 10232

MONTHLY COST STATUS REPORT

Contract No. AK-4947

Mr. Frank Lujan
Sandia Contracting Representative

Period Ending (1) 8/31/95

Contractor must forecast, as a minimum, through the Period of Performance, when costs will be incurred in these months.
Contractor must forward this report to reach the Sandia Contracting Representative no later than the 10th of the month following the Report Period
such other time as requested by the Sandia Contracting Representative.

Total Funds Authorized	\$ <u>25,000.00</u>
Existing Limitation of Obligation (2)	<u>25,000.00</u>
Actual Cost Incurred to Date (3)	<u>23,073.48</u>

Estimated Cost to Complete: (4)

Month following Period Ending* Estimated above	<u>1,926.52</u>	13th Month	_____
2nd Month	_____	14th Month	_____
3rd Month	_____	15th Month	_____
4th Month	_____	16th Month	_____
5th Month	_____	17th Month	_____
6th Month	_____	18th Month	_____
7th Month	_____	19th Month	_____
8th Month	_____	20th Month	_____
9th Month	_____	21st Month	_____
10th Month	_____	22nd Month	_____
11th Month	_____	23rd Month	_____
12th Month	_____	Remaining Balance (5)	_____

Total Estimate to Complete	<u>1926.52</u>
Total Estimated Cost at Completion	\$ <u>25000.00</u>

TES:
Last full month for which actual costs are available.
Do not forecast beyond Limitation of Obligation, if one exists. Any amount over the Limitation of Obligation, which is anticipated to be a future cost, should be included in "Remaining Balance."
Cost includes applicable fee.
Estimates for costs to be incurred (Do not include commitments), including applicable fee.
Remaining balance includes any forecasts beyond the specified months above and any amounts beyond the Limitation of Obligation.

Contractor: Georgia Tech Research Corporation
Address: Office of Contract Administration
Attn: C. D'Urbano
Centennial Research Building
Atlanta, GA 30332

Signed
David L. Moore Accountant II
Title
Phone: (404) 894-5791
Date: 9/20/95

Ordering Organization 10232

MONTHLY COST STATUS REPORT

Contract No. AK-4947

Mr. Frank Lujan
 Sandia Contracting Representative

Period Ending (1) 9/30/95

Contractor must forecast, as a minimum, through the Period of Performance, when costs will be incurred in these months.
 Contractor must forward this report to reach the Sandia Contracting Representative no later than the 10th of the month following the Report Period
 at such other time as requested by the Sandia Contracting Representative.

Total Funds Authorized	\$ <u>25,000.00</u>
Existing Limitation of Obligation (2)	<u>25,000.00</u>
Actual Cost Incurred to Date (3)	<u>25,000.00</u>

Estimated Cost to Complete: (4)

Month following Period Ending* specified above	_____	13th Month	_____
2nd Month	_____	14th Month	_____
3rd Month	_____	15th Month	_____
4th Month	_____	16th Month	_____
5th Month	_____	17th Month	_____
6th Month	_____	18th Month	_____
7th Month	_____	19th Month	_____
8th Month	_____	20th Month	_____
9th Month	_____	21st Month	_____
10th Month	_____	22nd Month	_____
11th Month	_____	23rd Month	_____
12th Month	_____	Remaining Balance (5)	_____

Total Estimate to Complete	<u>0.00</u>
Total Estimated Cost at Completion	\$ <u>25,000.00</u>

NOTES:

- Last full month for which actual costs are available.
- Do not forecast beyond Limitation of Obligation, if one exists. Any amount over the Limitation of Obligation, which is anticipated to be a future cost, should be included in "Remaining Balance."
- Cost includes applicable fee.
- Estimates for costs to be incurred (Do not include commitments), including applicable fee.
- Remaining balance includes any forecasts beyond the specified months above and any amounts beyond the Limitation of Obligation.

Contractor: Georgia Tech Research Corporation
 Address: Office of Contract Administration
 Attn: C. D'Urbano
 Centennial Research Building
 Atlanta, GA 30332

 Signed
 David L. Moore Accountant II
 Title
 Phone: (404) 894-5791
 Date: 10/20/95

October 23, 1995

Dr. R.A. Graham
Advanced Materials Physics Dept.,
Org. 1153, P.O. Box 5800
Sandia National Labs.,
Albuquerque, NM 87185

Dear Bob:

Enclosed please find the final report containing a compilation of reports/papers as part of our work under the Sandia Project No. AK 4947.

- (1) Report dated May 17, 1995, on MnO_2 powders and compacts
- (2) Report dated July 30, 1995, on Al_2O_3 powders and compacts
- (3) Paper on "Reaction Behavior of Shock Compressed Aluminum and Iron Oxide Powder Mixtures," to be published in *APS Topical Conference Proc., Shock Compression in Condensed Matter*, ed. S.C. Schmidt, 1995.

We thank you and the Sandia National Laboratories for support of this research effort.

Yours sincerely,

Naresh Thadhani
Tel: (404) 894-2651

E-18-X01 # 11
(Final RPE)

May 17, 1995

Dr. R.A. Graham
Org. 1152, P.O. Box 5800
Sandia National Labs
Albuquerque, NM 87185-1421

Dear Bob:

Enclosed is a brief summary of the analysis performed on the Shock-compressed MnO_2 samples which you sent us.

Please let me know if there is anything specific which you may want us to analyze in more detail.

Thanking you in anticipation.

Yours sincerely,

Naresh N. Thadhani
Associate Professor
Tel: (404) 894-2651

NNT/amg

Enclosure

xc: Dr. Vidya Subramanian

ANALYSIS OF SHOCK COMPRESSED MnO₂

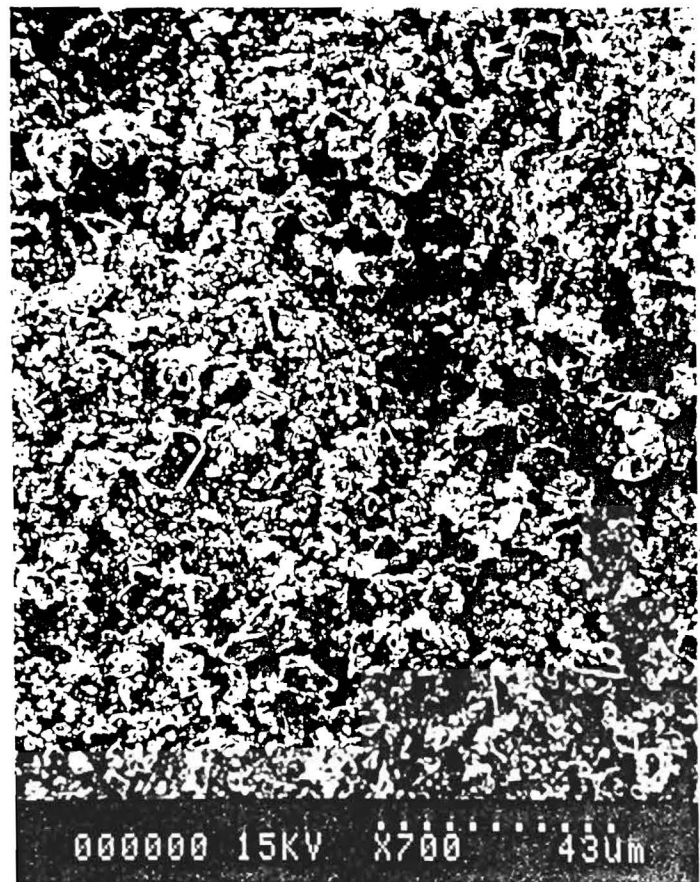
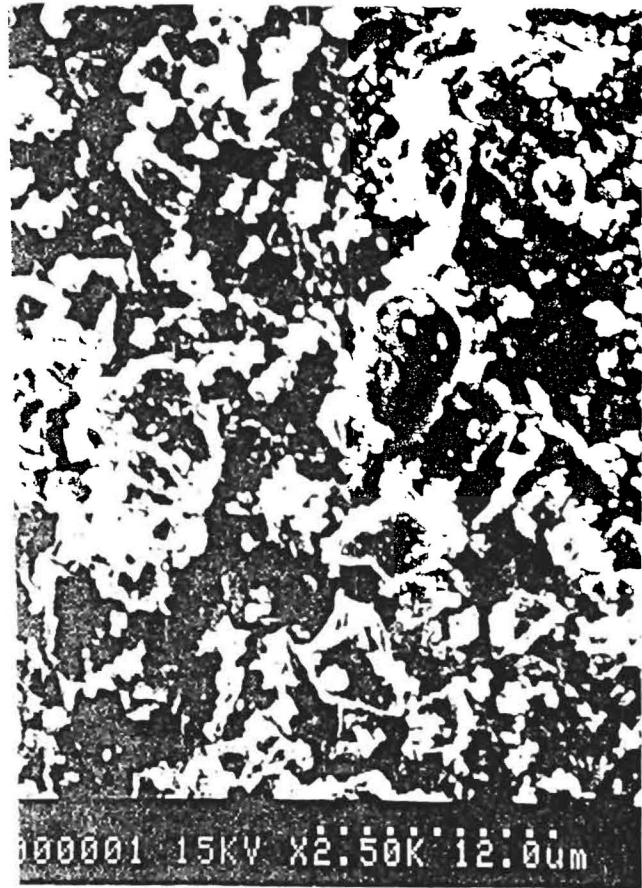
MnO₂ powders, shock compressed at different pressures (MB-B, MBA-B, MBA-CB), were analyzed by X-ray diffraction and SEM. The samples shocked at lower pressures (MB-B and MBA-B) are comprised of MnO₂ (pyrolusite) phase, which is the same as that of the starting powder. The sample shocked using MBA-CB is comprised of MnO₂ (pyrolusite) phase as well as Mn₂O₃ (Bixbyite). The samples shocked using MB-B and MBA-B are in the form of compacts and the SEM micrographs show that the starting powder has not significantly changed and is held together loosely. The sample shocked with MBA-CB is in the form of loose powder containing agglomerates of ~ 600 μm to 2 mm in size. The SEM micrograph shows that some deformation of the powder has taken place. The summary of the X-ray and SEM results is given in the table. The SEM micrographs and the X-ray diffraction data are shown in the figures.

SUMMARY OF SEM AND X-RAY ANALYSIS

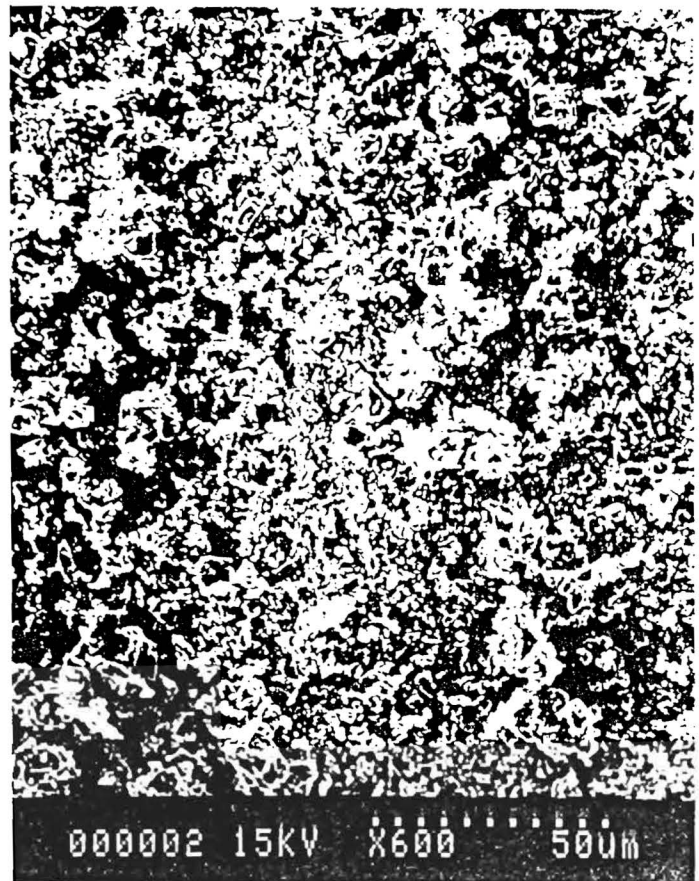
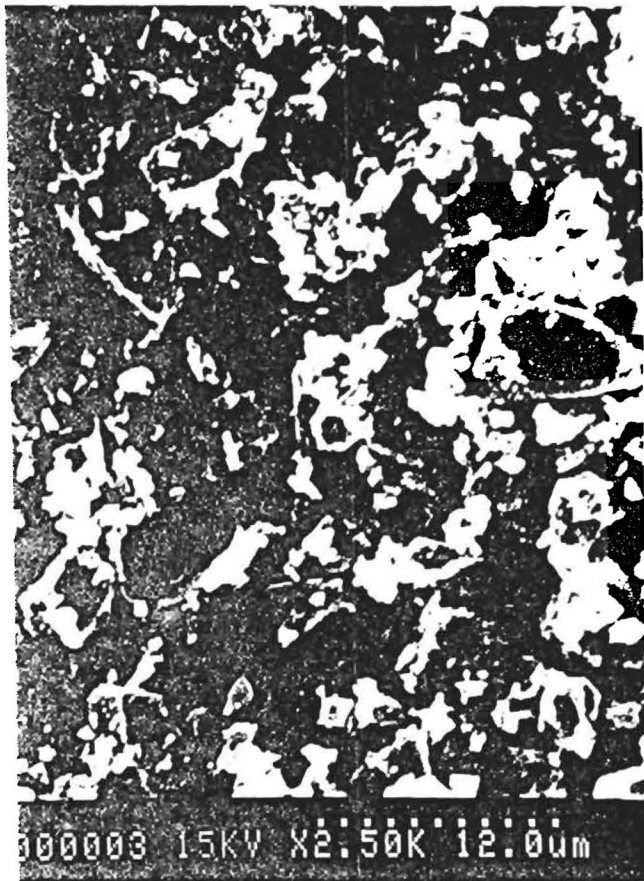
Sample	SEM Analysis	X-ray Analysis
Starting Powder	MnO ₂ powders of ~ 5-10 μm size.	MnO ₂ (Pyrolusite)
LE 94-107 (MB-B)	Compact containing MnO ₂ powders similar to starting powder.	MnO ₂ (Pyrolusite)
LE 94-108 (MBA-B)	Compact containing MnO ₂ powders similar to starting powder.	MnO ₂ (Pyrolusite)
LE 94-109 (MBA-CB)	Loose powders containing agglomerates which are comprised of deformed MnO ₂ powders.	MnO ₂ (pyrolusite) and Mn ₂ O ₃ (Bixbyite-orthorhombic or cubic)



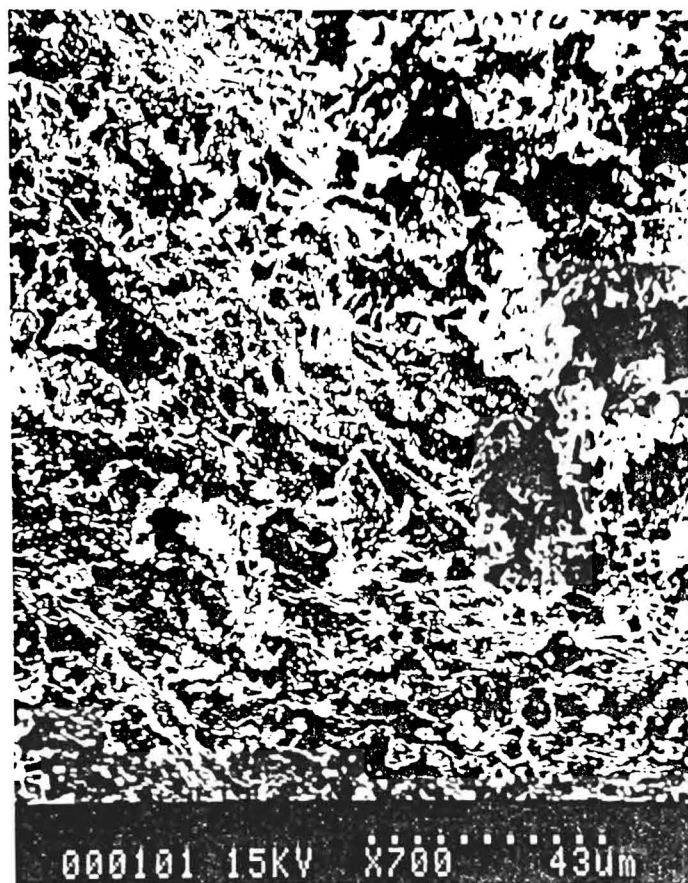
SEM micrographs of MnO₂ starting powder at different magnifications.



SEM micrographs of sample LE 94-107 (MB-B) at different magnifications.



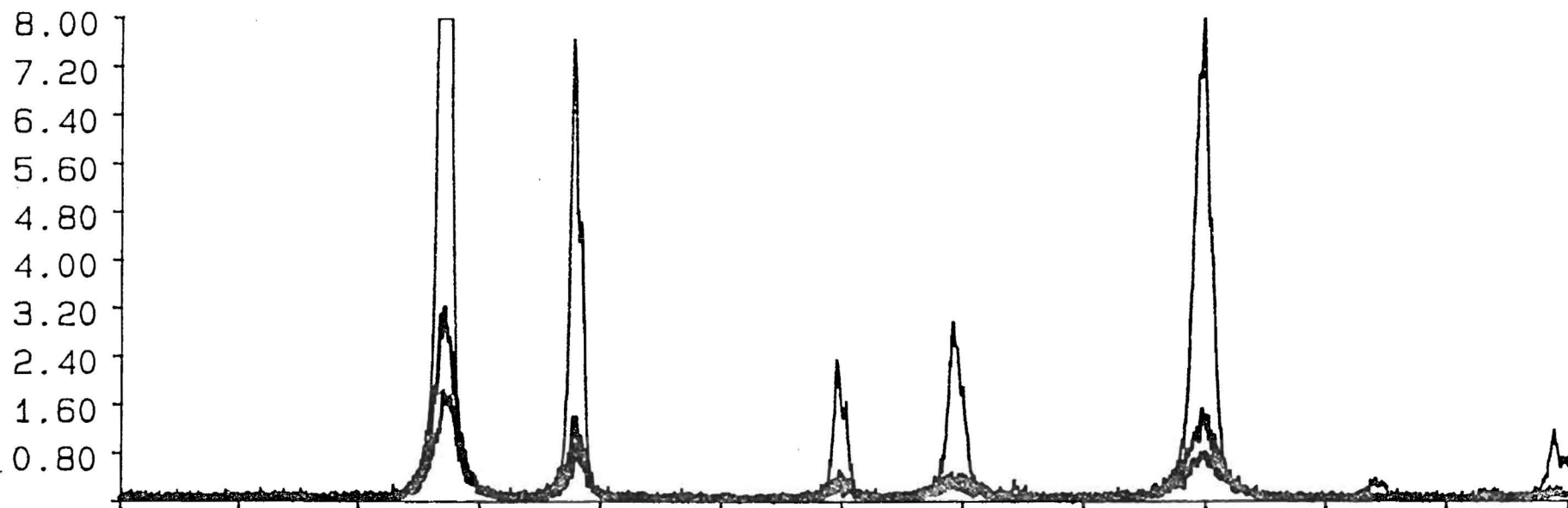
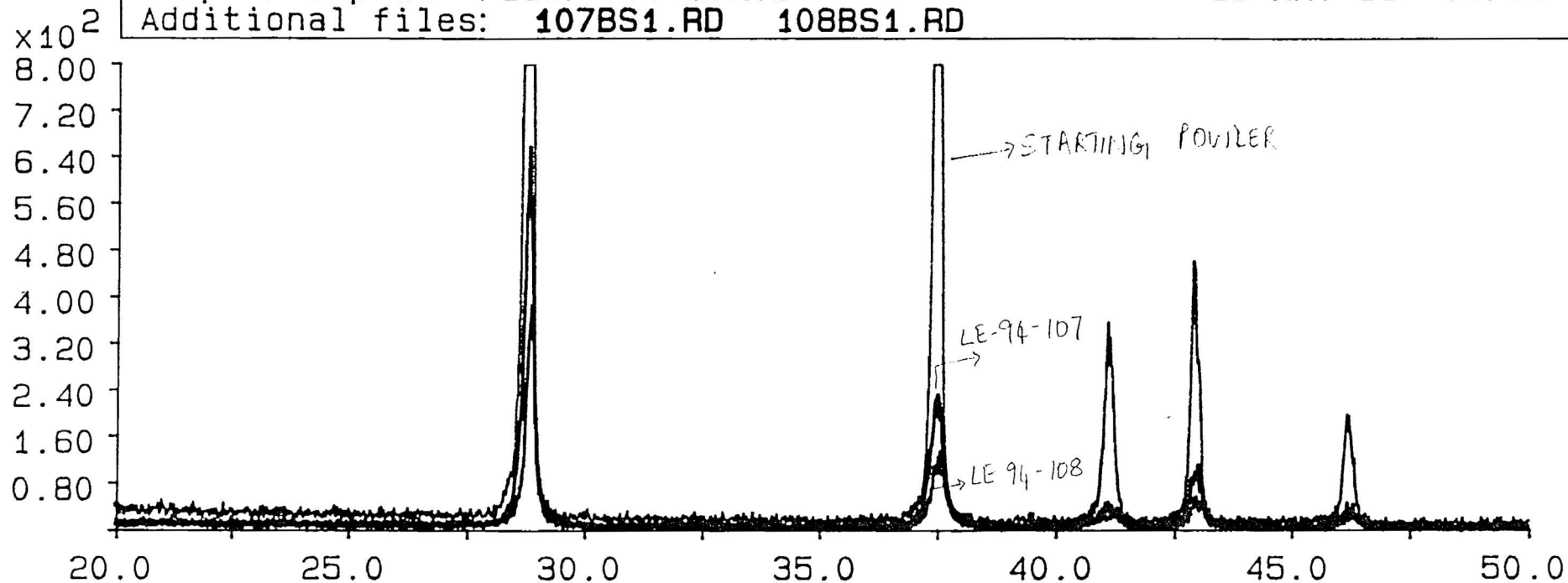
SEM micrographs of sample LE 94-108 (MBA-B) at different magnifications.



SEM micrographs of sample LE 94-109 (MBA-CB) at different magnifications.

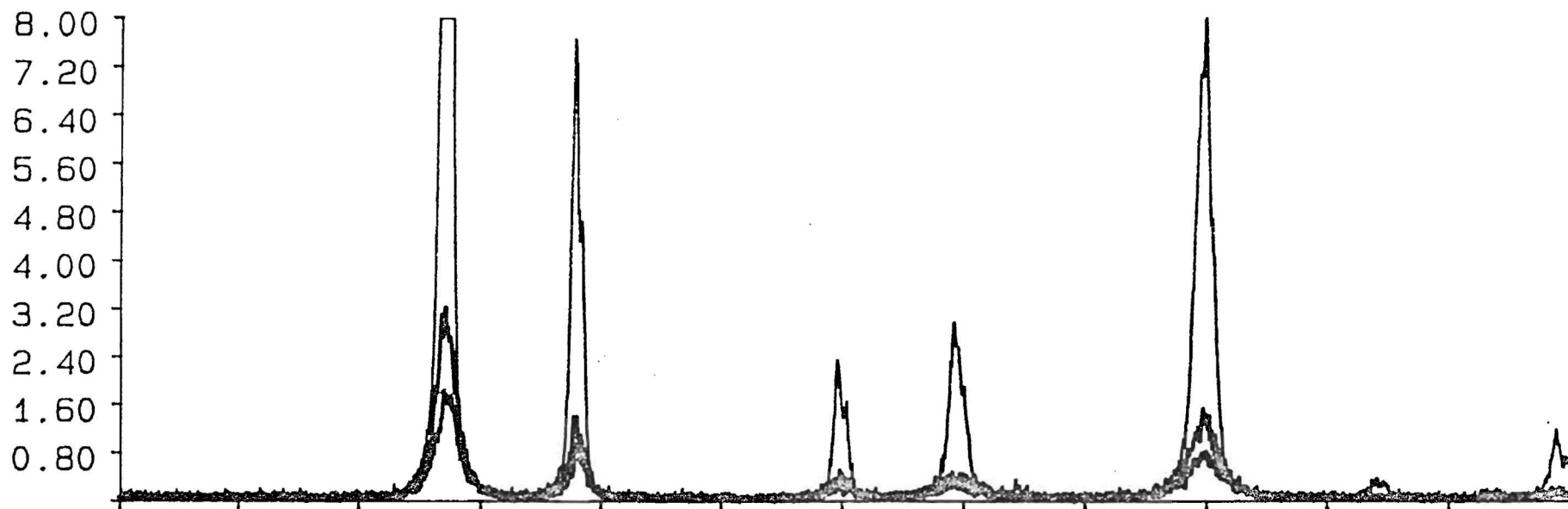
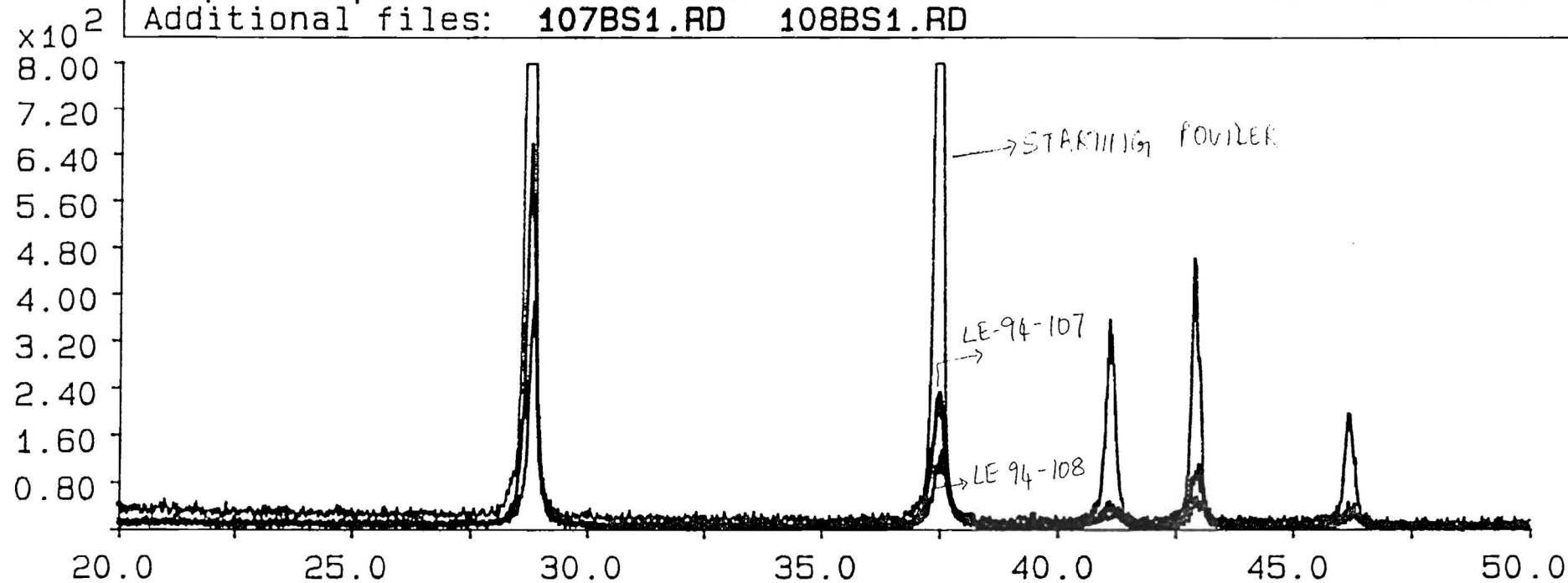
Sample: mnpwda File: MNPWDA.RD
Additional files: 107BS1.RD 108BS1.RD

15-MAY-95 09:36



Sample: mnpwda File: MNPWDA.RD
Additional files: 107BS1.RD 108BS1.RD

15-MAY-95 09:36



July 30, 1995

Dr. Ed K. Beauchamp
Dept. 1845, MS0333
Sandia National Labs
P.O. Box 5800
Albuquerque, NM 87185

Dear Dr. Beauchamp:

Enclosed please find our results of the strain analysis on the remaining Alumina powders and corresponding shocked compacts.

If you need any additional information about these, please do not hesitate to contact me. I thank you for the opportunity; and hope that the results will be useful.

Yours sincerely,

Naresh N. Thadhani
Associate Professor
Tel: (404) 894-2651

NNT/amg

cc: Dr. R.A. Graham, Sandia, ORG 1152
Dr. V. Subramanian

STRAIN ANALYSIS OF SANDIA Al_2O_3 USING X-RAY DIFFRACTION

The shocked samples were ground using a pestle and mortar to obtain powders which were used for the X-ray scans. Scans were done using a step size of 0.015° and a scan time of 5 seconds. The $K\text{-}\alpha_2$ component was first stripped from the pattern. The peaks were then fit with a lorentzian function using the software "Genplot". The width of the peak at half the intensity (FWHM) was also obtained from the software. The broadening due to the instrument was obtained from a Si standard sample. The instrumental broadening was found to follow the equation

$$\beta_{\text{inst}} = 9.024 \cdot 10^{-6}(2\theta) + 1.458 \cdot 10^{-3}$$

where β_{inst} is the peak width due to instrumental broadening and θ is the diffraction angle. The instrumental broadening was subtracted from the FWHM of the sample peaks to obtain the true peak breadth (β). The peak breadth (β) is related to the strain (ϵ) and crystallite size (t) as given below

$$\beta \cos \theta = 2\epsilon \sin \theta + \lambda/t, \text{ where } \lambda \text{ is the wavelength.}$$

The $\beta \cos \theta$ and $\sin \theta$ values were plotted for the samples and were linearly fit. The strain was obtained from the slope of the linear fit.

STRAIN

Powder	Starting Powder	M-B	M-CB	MBA-CB
Alcoa A-14	0.0001	0.00405	0.00685	0.007
Alcoa A-152SG	0.0018	0.00535		
Alcoa A-16SG	0.00055	0.0041		
Alcoa A-3500SG	0.00075	0.0044		

LIST OF FIGURES

- Figure 1. Plot of $\beta\cos\theta$ vs $\sin\theta$ for A-14 starting powder and shocked samples
- Figure 2. Plot of $\beta\cos\theta$ vs $\sin\theta$ for A-152SG starting powder and shocked sample (MB-B)
- Figure 3. Plot of $\beta\cos\theta$ vs $\sin\theta$ for A-16SG starting powder and shocked sample (MB-B)
- Figure 4. Plot of $\beta\cos\theta$ vs $\sin\theta$ for A-3500SG starting powder and shocked sample (MB-B)
- Figure 5. Plot of $\beta\cos\theta$ vs $\sin\theta$ for the starting powders
- Figure 6. Plot of $\beta\cos\theta$ vs $\sin\theta$ for the MB-B shocked samples

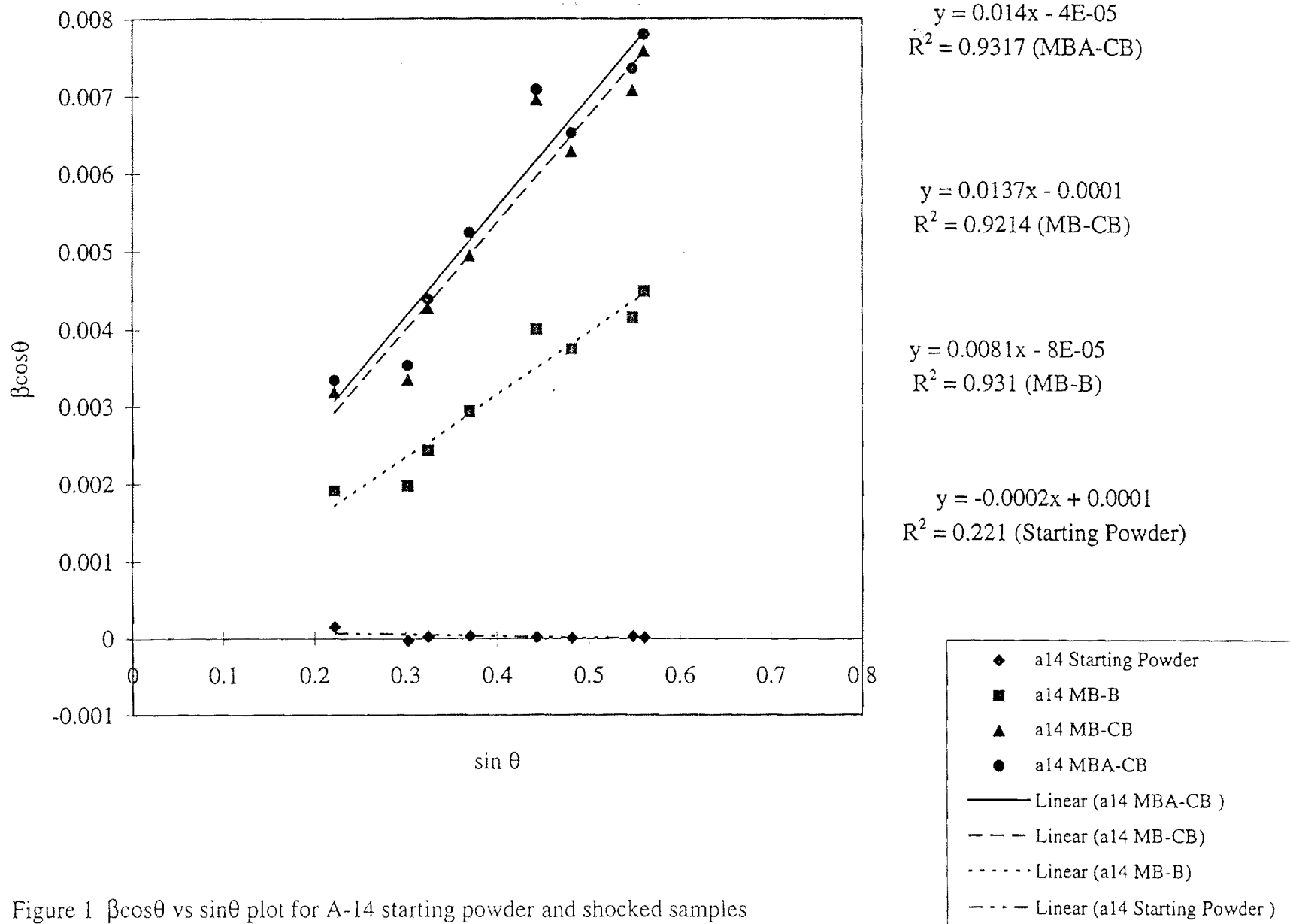


Figure 1 $\beta \cos \theta$ vs $\sin \theta$ plot for A-14 starting powder and shocked samples

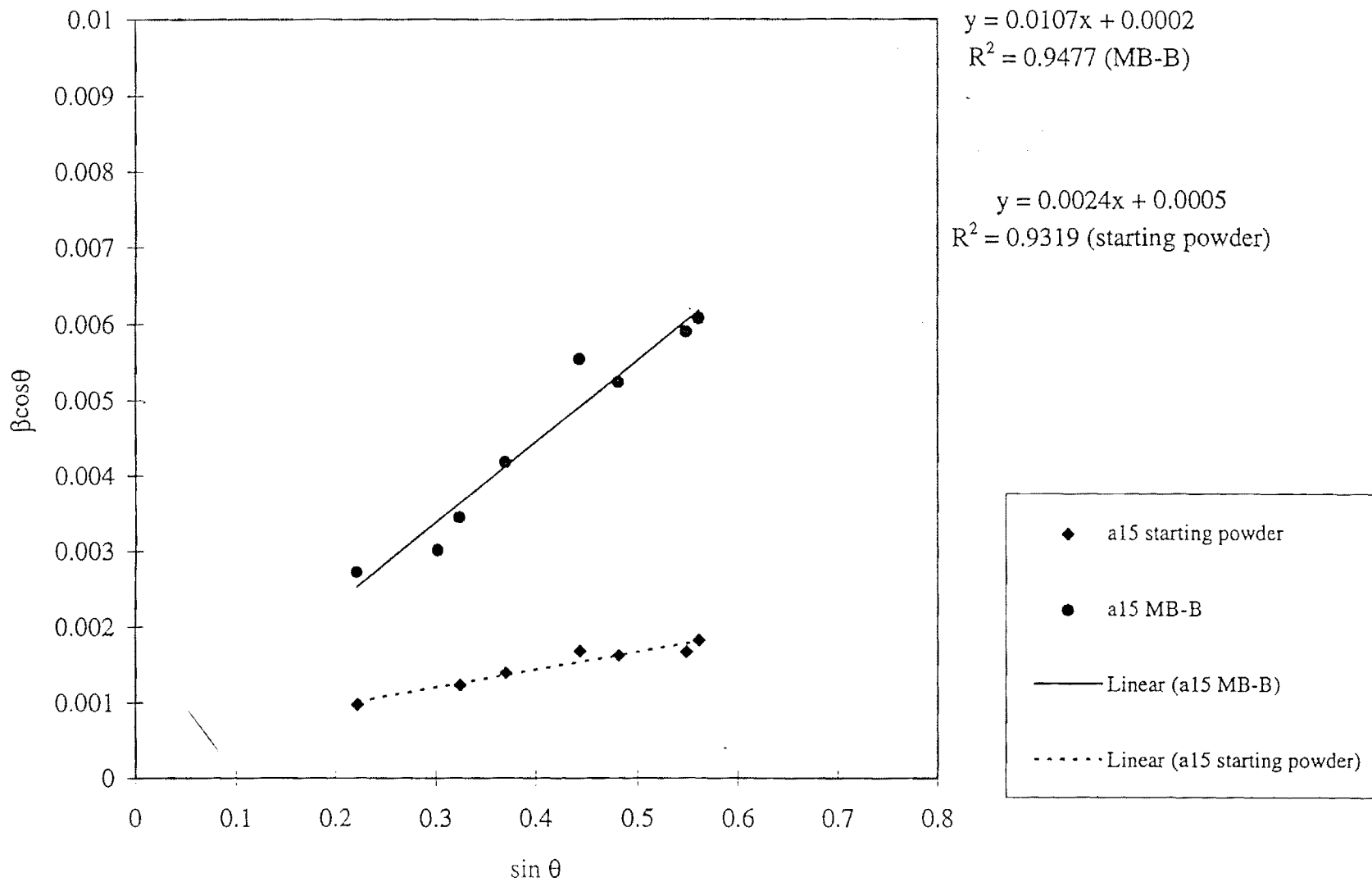


Figure 2 $\beta \cos \theta$ vs $\sin \theta$ plot for A-152SG starting powder and shocked sample (MB-B)

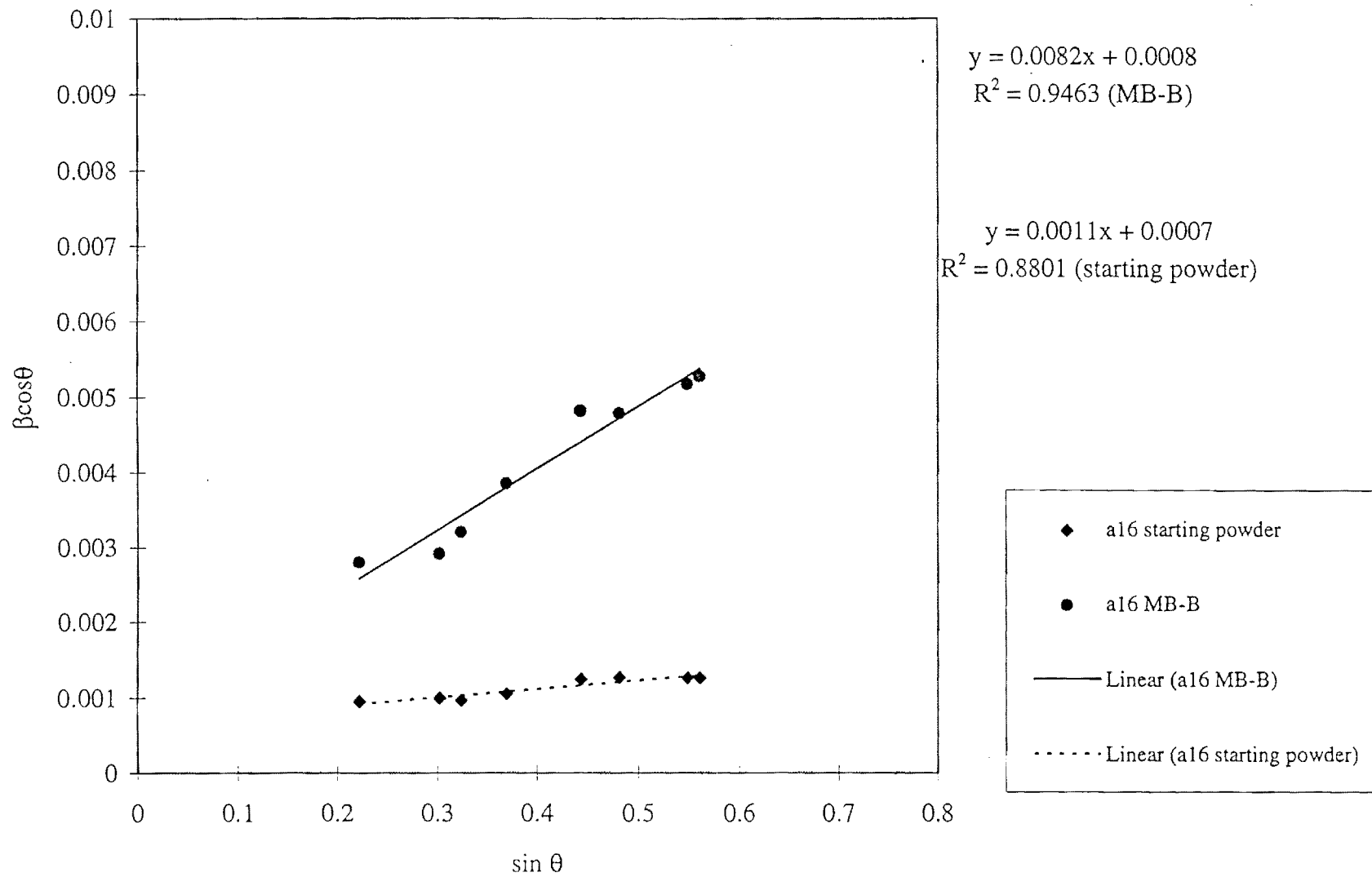


Figure 3 $\beta \cos \theta$ vs $\sin \theta$ plot for A-16SG starting powder and shocked sample (MB-B)

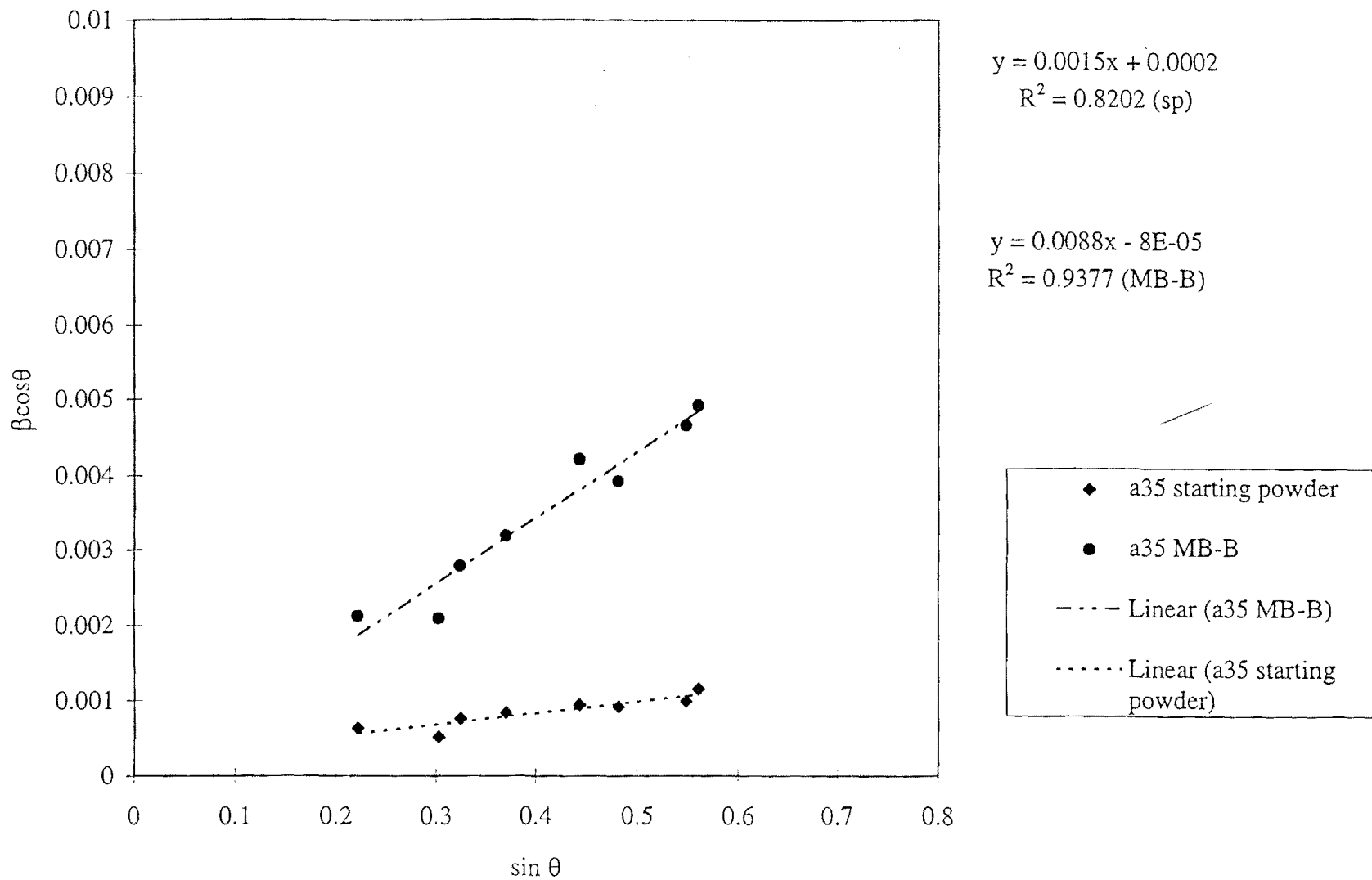
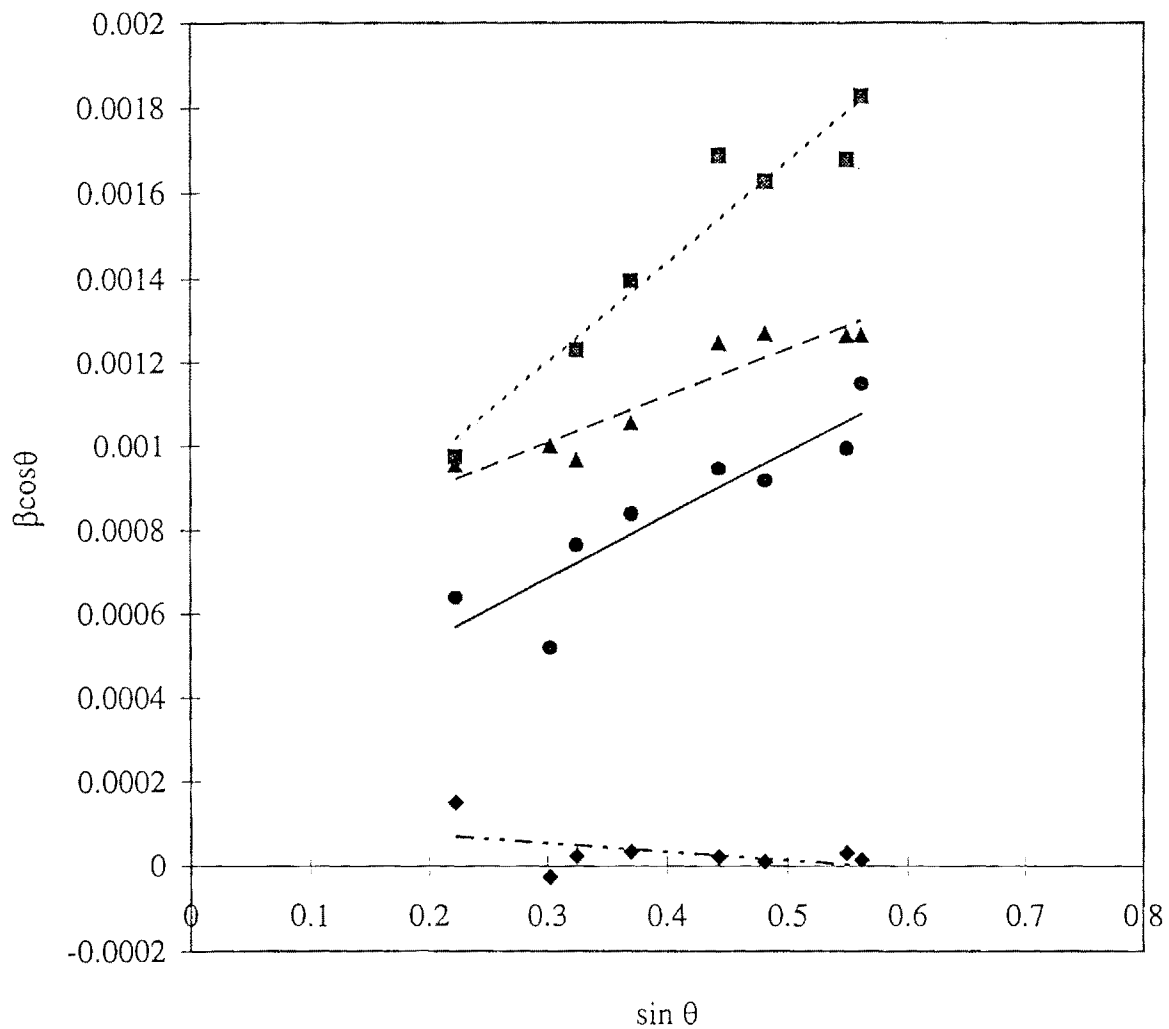


Figure 4 $\beta \cos \theta$ vs $\sin \theta$ plot for A-3500SG starting powder and shocked sample (MB-B)



$$y = -0.0002x + 0.0001$$

$$R^2 = 0.221 \text{ (a14)}$$

$$y = 0.0024x + 0.0005$$

$$R^2 = 0.9319 \text{ (a15)}$$

$$y = 0.0011x + 0.0007$$

$$R^2 = 0.8801 \text{ (a16)}$$

$$y = 0.0015x + 0.0002$$

$$R^2 = 0.8202 \text{ (a35)}$$

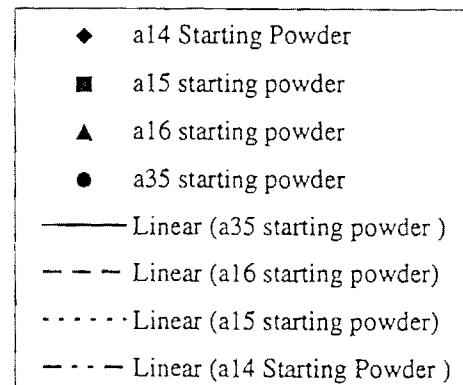
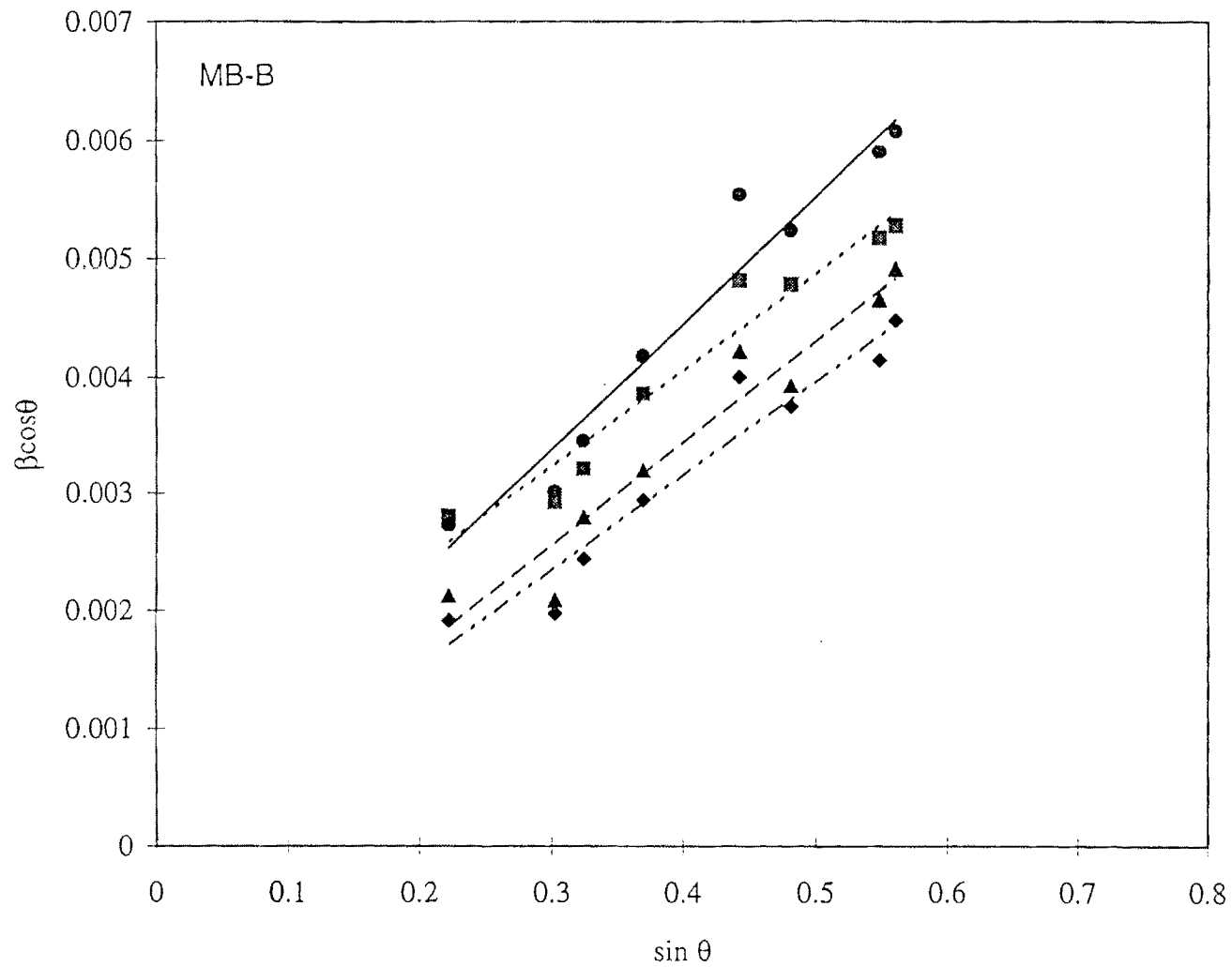


Figure 5 $\beta\cos\theta$ vs $\sin\theta$ plot for the starting powders



$$y = 0.0081x - 8E-05$$

$$R^2 = 0.931 \text{ (a14)}$$

$$y = 0.0088x - 8E-05$$

$$R^2 = 0.9377 \text{ (a35)}$$

$$y = 0.0082x + 0.0008$$

$$R^2 = 0.9463 \text{ (a16)}$$

$$y = 0.0107x + 0.0002$$

$$R^2 = 0.9477 \text{ (a15)}$$

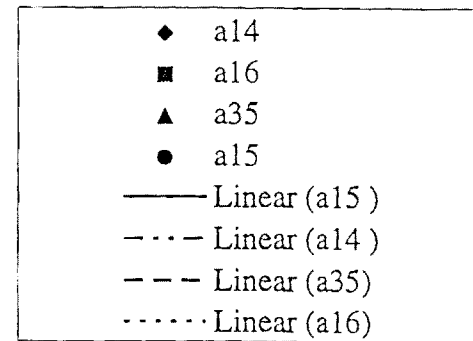


Figure 6 $\beta \cos \theta$ vs $\sin \theta$ plot for the MB-B shocked samples

STRAIN

Powder	Starting Powder	PB-B	MB-B	MB-CB	MBA-CB
Alcoa A-14	-0.0001		0.00405	0.00685	0.007
Alcoa A-152SG	0.0018		0.00535		
Alcoa A-16SG	0.00055	0.0033	0.0041		0.0082
Alcoa A-3500SG	0.00075		0.0044		
Sumimoto	-0.0001			0.00745	0.00875

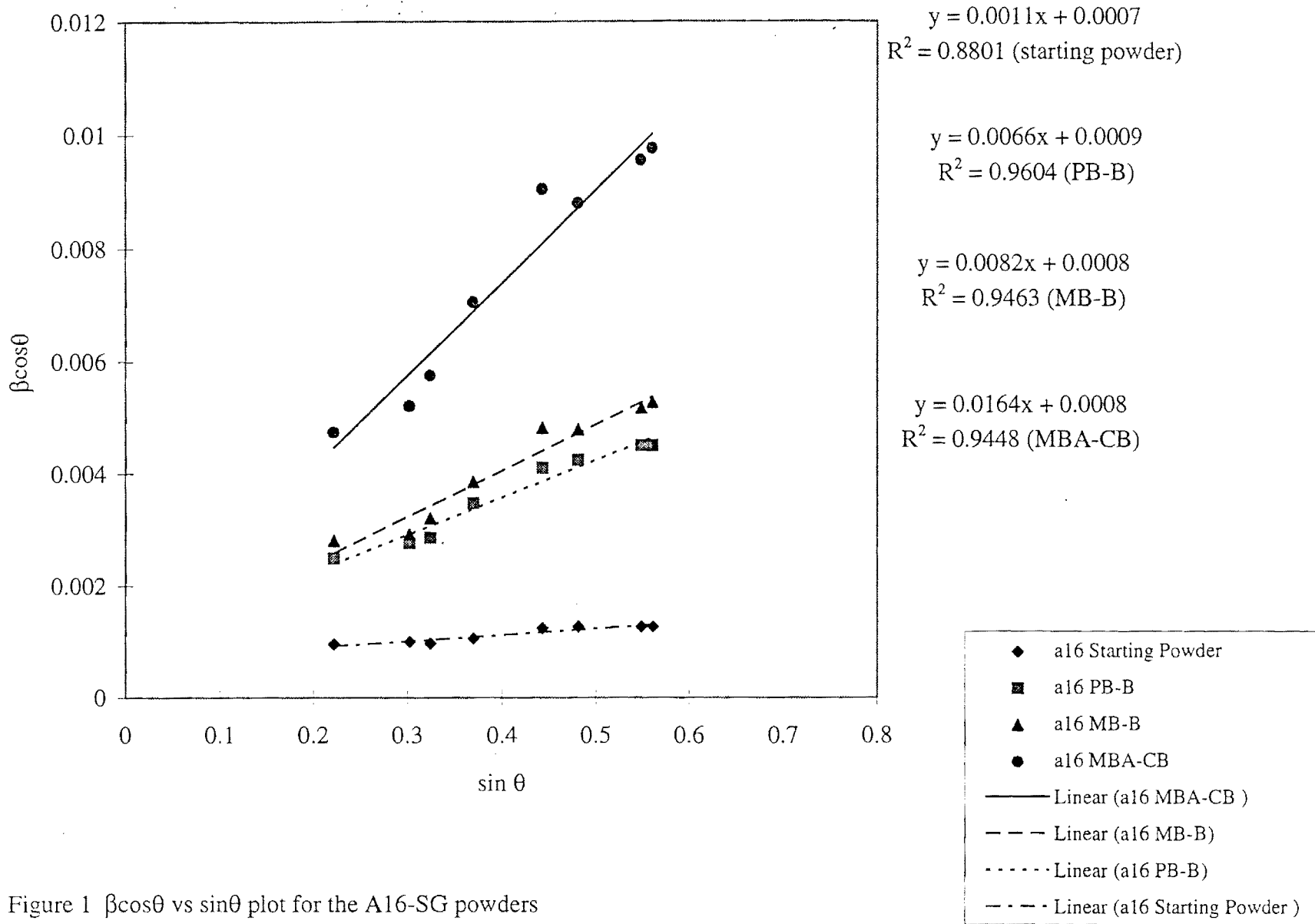


Figure 1 $\beta \cos \theta$ vs $\sin \theta$ plot for the A16-SG powders

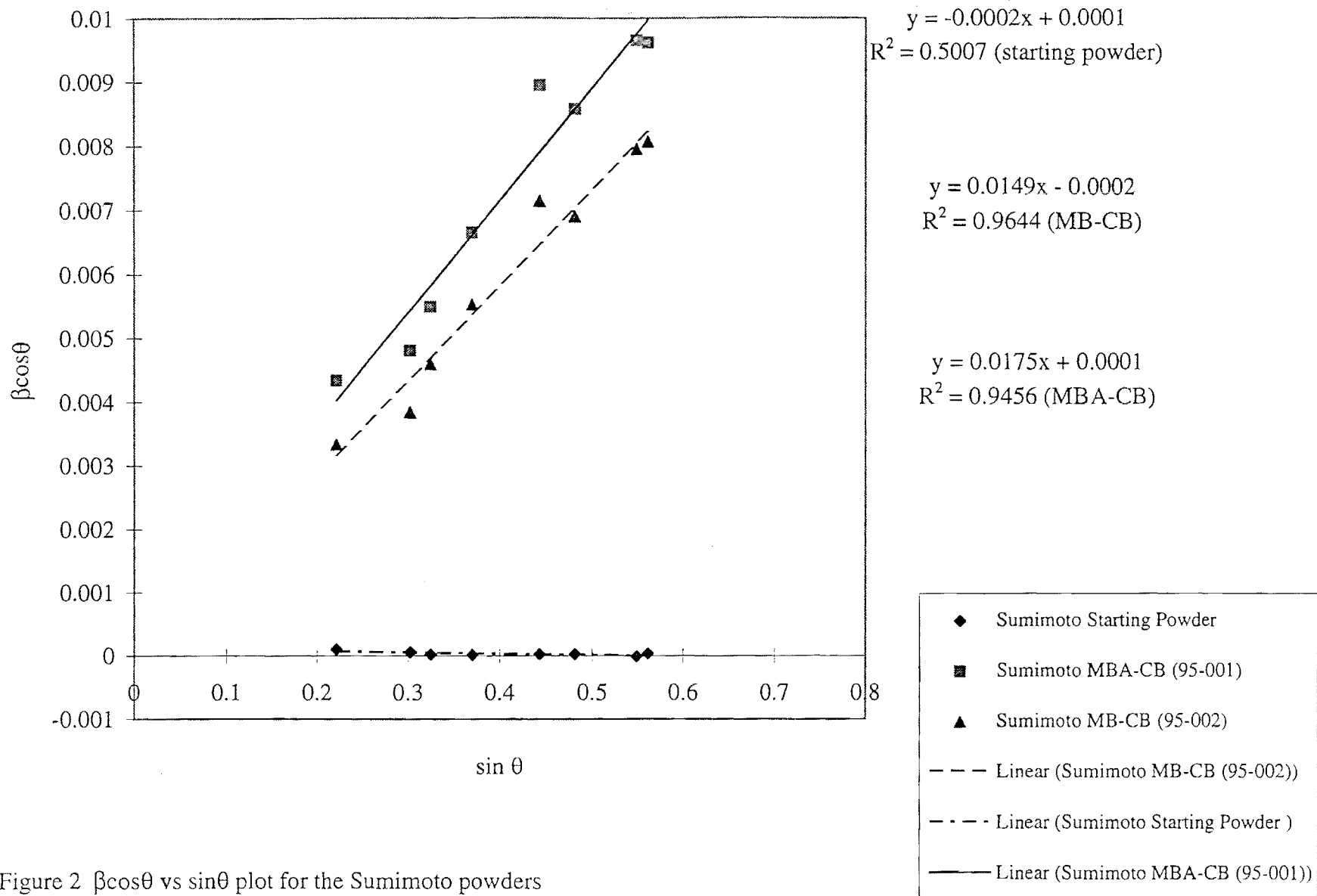


Figure 2 $\beta \cos \theta$ vs $\sin \theta$ plot for the Sumimoto powders

Library does not have:
Part three of Final Report.