PEAO6_ENS_2

## Preparation of Nanocrystalline TiO2 /Activated Carbon Composite Catalyst for the Removal of Phenol in Aqueous Solution

**Apisit Songsasen (Kasetsart University, Thailand); Chelermpan Ngamsopasiriskun (Kasetsart University, Thailand)**

The nanocrystalline $TiO_2$/activated carbon composite catalyst ($TiO_2$/AC) was prepared through sol-gel method in isopropanol mixed with activated carbon (AC). The prepared-$TiO_2$/AC was calcined at 400 °C and characterized. The XRD pattern indicated that the $TiO_2$/AC was in Anatase phase. TEM image showed that the crystallite size of $TiO_2$/AC was in the range of 7-9 nm. The specific surface area from BET method was 441 $m^2/g$ and adsorption capacity determined from adsorption isotherm was $5.0\times10^4$ mg/g. The $TiO_2$/AC calcined at 400 °C was used to remove phenol in aqueous solution under UV irradiation, which showed the highest removal efficiency when compared with $TiO_2$ (Degussa-P25) and AC. The % removal of 100 ppm phenol by 0.4 g of $TiO_2$/AC in 4 hours was 62.61%, due to both adsorption and photocatalytic degradation.

PEAO6_ENS_3

## Effect of Filter Media Characteristics, pH and Temperature on the Ammonia Removal in the Wastewater

**Noor Rosyidah Sajuni (Universiti Sains Malaysia, Malaysia); Abdul Latif Ahmad (Universiti Sains Malaysia, Malaysia); Vel Vadivelu (Universiti Sains Malaysia, Malaysia)**

Biological filtration in the broadest sense includes any filtration technique that utilizes biological (living) organisms to remove impurities from the wastewater. Filter media selection is critical in the operation to achieve effluent quality requirements. The most important is to choose the correct types of filter media. Laboratory studies were conducted to evaluate the optimum ammonia removal performance using four different types of filter media (Ceramic Ring A, Ceramic Ring B, Japanese Filter Mat and Filter Wool) at different ammonia loading rates of 20 until 120 mg/L. Ceramic Ring A has been found to give the best performance with respect to their efficiency of ammonia removal because of high surface area and characteristic roughness. In general, nitrification is most efficient at pH levels ranging from about 7.5 to 9.0. Water temperature was kept between (27 and 30 °C). Nitrification efficiency is slower at lower temperatures.

PEAO6_ENS_4

## Nanostructural Analysis of Finogel (Fish Nano Gelatin) for New Process Development

**Hammed Monsur (Int. Islamic University, Malaysia, Malaysia); Irwandi Jaswi (Int. Islamic University, Malaysia, Malaysia); Hamzah Salleh (Halal Industry Research Centre,, Malaysia)**

One of the most important applications of nanotechnology is process evaluation and development. Different pattern was observed for gelatins pretreated differently. Four types of pre-treatment solution were used during fish gelatin extraction in this study. They were acetic acid (A), acetic acid-NaCl (AS), acetic acid-NaOH (AB) and acetic acid-NaOH-NaCl (ABS). Results showed that each pretreatment gave different nano imaging patterns; A (fibril), AS (zig-zag cracks), AB (straight rods) and ABS (cross-linked rods). Cross-linked rods observed in ABS denote adequate removal of non-collagen content of the fish skin and increase its surface area. ABS is suggested as the best pretreatment for perch fish gelatin.

PEAO6_ENS_5

## Stability Characteristics of Water in Oil Emulsions

**Mansor Nuraini (Universiti Malaysia Pahang, Malaysia)**

Emulsion either water in oil or oil in water emulsion can be important in almost all stages of upstream activities in petroleum industry such as drilling, completion, production,transportation and separation of emulsified crude oil. The rheological properties and the characteristic of the emulsion are very important for it has wide application in the oil industry. In order to get better understanding, the effect of various factors influencing the stability of emulsion, a study on effect of mixing time, speed and temperature during preparing the emulsion have been done as well as the influenced of type of emulsifier group on water in oil emulsion. The results revealed that the Span 83 can stabilized the water in oil emulsion better than other three emulsifiers. Besides, the mixing time, speed and temperature during preparing the emulsion have given influenced on emulsion stability.

PEAO6_ENS_6

## A Study of Rate of Reaction of Carbon Dioxide on Hydrotalcite Pellets of Different Sizes with Temperature.

**Weeramundage James Noel Fernando (Universiti Sains Malaysia, Malaysia); Nadia Isa (Universiti Sains Malaysia, Malaysia); Abdul Latif Ahmad (Universiti Sains Malaysia, Malaysia); Mohd Roslee Othman (Universiti Sains Malaysia, Malaysia)**

Many researchers have carried out adsorption and separation of carbon dioxide on hydrotalcites. These have been mainly limited to study of powders and membranes based on hydrotalcites. However, industrial applications based on hydrotalcite may demand a form of hydrotalcite which could be easily handled, transported and of market appeal. Pelletized form of hydrotalcites could meet such industrial criteria. In this paper, studies are presented on experiments of adsorption of carbon dioxide on pellets of hydrotalcite of different sizes under different temperature conditions. Experimental data are assimilated in order to evaluate adsorption rates. Further studies are extended with pellets coated with sol gel coated hydrotalcite membranes of different coatings. The results are analyzed using response surface methodology (RSM) based on central composite rotatable design. Furnace temperatures (32 °C-550 °C), sizes of pellet (diameter: 8 mm - 20 mm), number of pellet coating and reaction time were chosen as process factors (variables) for the optimization. It was observed that the rate of reaction showed favorable results on the larger pellet sizes and does not showed dependence on the number of coats of membrane. A highest rate of adsorption was observed