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higher activation rates compared to other activation methods. An activation time of 5 hours under CO_2 blanket resulted in higher surface area and pore size. Moreover, it was shown that using small proportion of $ZnCl_2$ and H_3PO_4 creates an initial narrow microporosity. In this case further physical activation will grantee better development for the pore structure. In terms of pore size distribution the combined preparation method resulted in a better and more homogenous pore size distribution than the commercial palm shell based activated carbon.

PEAO6_GTR_1

Observation on Recombinant Bromelain Activity Before and After Purification

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Stem bromelain is a protease that commercially applied in many food processing industries such as in baking and cheese production and also as a meat tenderizer. It is also demonstrates both *in vitro* and *in vivo* therapeutic and pharmaceutical properties. Nowadays, the production of Bromelain in a factory consists of continuously process after they cleared the pineapple fields. However, it needs a high cost downstream bioprocess from extraction, purification till the packaging because of the existence of protease mixture in the pineapple waste and the instability of the Bromelain itself. Thus, this study is aims to use recombinant DNA technology in order to obtain a consistent yields with very high purity and activity and finally, making a viable industrial process feasible. The recombinant bromelain gene was successfully cloned and expressed in expression vector and transformed into BL21-AI cells. An active and functional recombinant Bromelain was successfully produced after purifiying it using the affinity chromatography technique. In order to develop the best purification strategy, recombinant Bromelain activity was observed before and after purification. The protease activity of recombinant Bromelain is increased as the protein purified. The difference in activity of recombinant Bromelain was discovered between the protein that extracted using native and denaturing conditions. The development of purification strategies by determining the recombinant Bromelain activity can further be used to purify the large scale production of recombinant Bromelain.

PEAO6_GTR_2

Identification of Potential Biomarker in Heart Proteome for Authentication of Halal Slaughtered Chicken

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Nowadays, commercial slaughterhouses practice stunning method in which the chickens were paralyzed in an electrified water bath prior to the slaughtering process. Such treatment was introduced to ease up and fasten the slaughtering process in mass production. In Malaysia, the current for stunning treatment was only allowed to be in the range of 0.25 A to 0.5 A. However, there is no method to identify the chicken that has been slaughtered according to Halal requirement, except through *in-situ* inspection by Department of Islamic Development Malaysia (JAKIM) officer. In this study, a simple and reliable method using proteomic approach has been developed. Results showed that the sample collected from chicken that slaughtered after over stunning contained potential protein that could serve as biomarker in differentiating the overdose stunning from the non-stunning and standard stunning of low voltage. This preliminary study encourage for further detection kit development, which will be rapid, simple and reliable. Then, non-Halal, over stunned chickens will be identified even if they are already in supermarket.

PEAO6_GTR_3

Nanocrystalline Zeolite: a Review

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Nanocrystalline zeolite has received considerable attention in the catalysis community. Zeolites with a crystal size smaller than 100 nm are the potential replacement for existing zeolite catalysts due to its unique features with added advantages. Several research groups reported synthesis conditions that yield different types of zeolites in small size crystals. The decrease in the crystal size produced changes in the physicochemical properties of the zeolite compare to microcrystalline zeolite. This paper will focus on the synthesis and characterization of nanocrystalline zeolite as catalysts. The application of nanocrystalline zeolite as catalyst in catalytic cracking is also discussed.

PEAO6_GTR_4

Effect of pH on the Biotransformation of (R)-1-(4-Bromo-Phenyl)-Ethanol by Using *Aspergillus niger* as a Biocatalyst

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Molecular chirality is a fundamental phenomenon that plays an important role in biological processes. Currently, much attention has been focused on the production of chiral alcohols. Chiral alcohols such as (R)-1-(4-bromo-phenyl)-ethanol is important as a useful starting material used in pharmaceutical industries for drug synthesis. There are many factors that influenced the bioconversion which some of the crucial ones include the pH of the media, biotransformation time, substrate concentration, and agitation speed. All of these factors significantly affect the percentage of enantiomeric excess as well as the percentage conversion of the chiral alcohol. In this work, biocatalytic production of (R)-1-(4-bromo-phenyl)-ethanol was achieved via asymmetric reduction of 1-(4-bromo-phenyl)-ethanone using the shake-flask method at the reaction conditions of 30o C, 1mmol of substrate, agitation speed at 150 rpm and at various pH's. Since *Aspergilus niger* can easily grow, therefore, it was used as a biocatalyst in the reaction. Based on the result attained, pH 7 gave the highest of enantiomeric excess (96%) at the reduction time 48 hr. Meanwhile the best conversion