Recovery of Palladium using Adsorption by Bleached Waste Newspaper

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ABSTRACT

The recovery of palladium (Pd) from leaching solution using co-adsorption with cetyltrimethylammonium bromide (CTAB) onto bleached waste newspaper (BWN) was studied. The BWN was prepared by sodium hydroxide and sodium chlorite treatments. The structural analysis of raw and bleached newspaper were studied by Fourier transform infrared (FTIR) spectroscopy, X-ray diffraction (XRD) spectrometry, and thermogravimetric (TGA) analysis. The adsorption parameters such as hydrochloric acid concentration, metal ion concentration, cetyltrimethylammonium bromide (CTAB) concentration and bleached newspaper (NSB) dosage that governed the adsorption behaviour of Pd were also investigated. The preliminary results indicated that 96.4 % recovery of palladium was achieved using 1 mL of 100 mM CTAB and 25 mg BWN.

| Bleach Newspaper | Adsorption | Precious metal |

Screening of Catalyst for The Biodiesel Production

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ABSTRACT

The development of renewable, non-toxic and carbon-neutral alternative fuels is because of the world is confronted with the twin crises of fossil fuel depletion and environmental degradation. Therefore, many countries are facing this problem with new alternative fuel that called biodiesel. Biodiesel is made through a chemical process called transesterification. The feedstocks of the biodiesel production are made of vegetables oil and animal fats. Non-edible from vegetables oil is used because of the lower cost and reliable feedstocks. Catalyst was studied as heterogenous catalyst in the transesterification reaction of croton *megalocarpus* oil with methanol for biodiesel production. The study aimed at the best oil and the catalyst that suitable for the biodiesel production. Two types of catalyst CaO and silica mesoporous-macropaticles (SMP) had been run in the reaction of transesterification process. Therefore, the parameter that involved in the process had been fixed the amount of the catalyst, ratio of methanol to oil, temperature, and reaction time with 3wt% of catalyst, 6:1 ratio, 333 K, and 60 min, respectively. The conversion of Croton *megalocarpus* oil reached 72% using CaO as catalyst while 60% conversion using SMP.

| transesterification| croton *megalocarpus* oil|SMP | CaO |

Photocatalytic activity of chromium-doped titania in degrading congo red and methylene blue under visible light

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ABSTRACT

A series of 0.5 – 4 mol% Cr-doped TiO_2 photocatalysts synthesized via sol-gel method were tested over photodegradation of congo red and methylene blue under visible light irradiation. Presence of Cr dopant has induced anatase-rutile phase transition, resulted in high rutile percentage of 45% in the material. Besides, the addition of Cr has extended the absorption wavelength of TiO_2 to visible light region. As evidenced from the photoluminescence analysis, electron-hole recombination rate of Cr-doped TiO_2 decreased when the Cr content was varied from 0.5 to 3 mol%. Despite using the same series of photocatalysts, the optimum Cr dopant which gave the best photocatalytic activity was different: 3 mol% Cr-doped TiO_2 was the best photocatalyst for removing congo red while 1 mol% Cr-doped TiO_2 was the best photocatalyst for removing methylene blue. Apparently, the nature of targeted subtract in photodegradation affected the photocatalytic performance of the Cr-doped TiO_2.

| Cr-doped TiO_2| | Photocatalyst | Methylene Blue | Congo Red | Visible light |