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IN 19 (Poster)

COMPARATIVE STUDY OF THERMAL CONDUCTIVITY ENHANCEMENT USING NANOFLUID BASED NANOCARBON FOR HEAT EXCHANGER APPLICATION

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High thermal conductivity of various nanocarbons has a huge potential for enhancing fluidic heat transfer applications. This paper present a study to enhance the thermal conductivity using nanofluid based nanocarbon. Three different nanocarbons (NC300, NC200 and Commercial CNT) were employed with present of sodium dodecyl sulphate (SDS) and deionized water. NC300 and NC200 were produce by Nanoc Sdn Bhd meanwhile the commercial CNT are manufactured by MER Corporation. In this work, different weight ratio of nanocarbon (0.4-1.0 wt%) were set up in order to get the series of thermal conductivity. Thermal conductivity was then measured at 6°C, 25°C and 45°C using KD2 Pro thermal properties analyzer. The result mostly show an enhancement of thermal conductivity. Among all, NC300 CNT with 1wt% ratio gave the highest conductivity when measured at 45°C with enhancement of ±30%.

Keywords: Thermal conductivity, nanofluid, nanocarbon

IN 20 (Poster)

HYBRIDIZED Ni-Co SYSTEM AS SUPERCAPACITIVE MATERIAL: THE ANALYSIS OF NANOSIZED METAL OXIDE AND PHASE FORMATION

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Co-precipitation has been adopted in the preparation of nickel-cobalt system for electrochemical double layer capacitors. The formation of spinel $NiCo_2O_4$ started below 400 °C based on X-ray Diffraction (XRD) analysis. The optimum compositional for the formation of this nickel cobaltite system was 1 mol Ni : 2 mol Co without the presence of monoxides at the calcination temperature of 400 °C. However, none of the compositions of Ni and Co calcined at 700 °C showed the occurrence of the spinel. The particle size of the prepared sample was confirmed using Transmission Electron Microscopy (TEM) with the value of 9.47 nm.

Keywords: Nanosized, Surface morphology, Phase formation, Co-precipitation,
Nickel-cobalt oxide

IN 21 (Poster)

SYNTHESIS AND CHARACTERIZATION OF CARBOXYMETHYL CHITOSAN-Fe_3O_4 NANOPARTICLES

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In this study, carboxymethyl chitosan bound Fe_3O_4 magnetic nanoparticles was synthesized by the covalent binding of carboxymethyl chitosan (CMC) onto the surface of Fe_3O_4 magnetic nanoparticles, which was developed by using coprecipitating method. These Fe_3O_4 and carboxymethyl chitosan-Fe_3O_4 nanoparticles were characterized by transmission electron microscopy (TEM), X-ray diffraction patterns (XRD), vibrating sample magnetometer (VSM) and Fourier Transform Infra Red (FTIR), respectively. This carboxymethyl chitosan-bound Fe_3O_4 nanoparticles was developed as a magnetic nanoadsorbent for the removal of some heavy metal ions especially in drinking water. The transmission electron microscopy (TEM) studies confirmed that the Fe_3O_4 and KMK-Fe_3O_4 particles have a range particle size of 9.73-12.30 nm dan 9.70-12.50 nm. The magnetic properties of the Fe_3O_4 particles were verified using vibrating sample magnetometer (VSM) showed their saturation magnetization, remanent magnetization and coercivity were 61.0 emu/g, 2.70 emu/g and 38.20 G, respectively. FTIR studies showed that appearance of peaks of 1629 cm^{-1} and 1397 cm^{-1} cm^{-1} are characteristic of COOM (M = metal ions) bands, indicating in the formation of the iron carboxylate.

Keywords: carboxymethyl chitosan , magnetic, nanoparticles, removal, heavy metal.