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Isolation of adulterants from liquid fuels using synthetic zeolite membranes

S S Tomar¹ and **R Tomar**² ¹S L P College, India ²Jiwaji University, India

I solation of adulterants from liquid fuels by synthetic membrane ZSM-22 was studied. Crystallization for synthesis of ZSM-22 membrane was carried out at a static condition under autogenous high pressure and temperature of 200°C. The synthesized membranes were characterized by x-ray diffraction, scanning electron microscopy, energy dispersive spectroscopy and Fourier transformed infra-red techniques. Characterization of the material suggested that the synthesized membrane was highly crystalline in nature possessing hollow rod like structure (elongated rods ~200 nm long and 20-50 nm in diameter) and having crystals in the range ~ 5-10 μ m. Effect of various parameters such as separation time, temperature, molar concentration, degree of swelling, zeolite loading for petrol-kerosene mixtures has been studied. The effect of time on separation of kerosene was studied by varying the time between 1 to 7 hours. The swelling percentage increases with increase in temperature till 170 and thereafter no considerable change in swelling with increase in temperature was observed. Swelling was also found to increase with increase in amount of zeolite membrane. It is observed that the degree of swelling increased almost linearly with increasing mass % of kerosene. The membrane thus used for isolation of adulterant from liquid fuel is found to be selective and cost effective.



Recent Publications

- 1. S S Tomar and Radha Tomar (2011) An ultrasonic method: A diagnostic tool to determine adulteration in liquid fuels. Journal of Pure and Applied Ultrasonics, 33(1):3-7.
- 2. Sanjay Kumar Singh, B K Singh, Radha Tomar and S S Tomar. Synthesis and characterization of nanocrystalline sodium potassium Fluorophlogopites and their role in trace metal ion sorption (under review in Colloid Journal).
- 3. Waheed Khanday, S K Singh, J Bhaudoriya, Majid, S S Tomar and Radha Tomar (2012) Study of sorption of Pb²⁺, Cd²⁺, Zn²⁺ and Cu²⁺ from waste water on synthetic analogues of clintonite. Colloid Journal 74(5):573-581.
- 4. B K Singh, Renu Tomar, Radha Tomar and S S Tomar (2011) Sorption of homologues of radionuclides by synthetic ion exchanger. Microporous and Mesoporous Materials 142(2-3):629-640.
- 5. S K Singh, S S Tomar and Radha Tomar (2009) Microemulsion- microwave synthesis of template free zeolite and its application for the sorption of toxic metal ions. Journal of Indian Chemical Society, 86:1-4.

sstgwl@gmail.com