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Removal of methylene blue from colored effluents by adsorption on to ZnAPSO-34 nanoporous material

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There are many conventional methods that can remove colored dyes from wastewater. There are several types of adsorbents being applied in industrial wastewater such as activated carbon, silica gel and alumina. Molecular sieves like aluminosilicate or aluminophosphate materials containing tiny pores of precise and uniform size, which are used as adsorbents, catalyst carriers, desiccants, and so on. Among the AlPOs, the metallo-aluminophosphates (MAPO) and metallosilico-aluminophosphates (MAPSO) materials encompass the characteristics of both zeolites and aluminophosphates, which results in their unique catalytic, ion-exchange and adsorbent properties. This work comprises of two parts :

1.ZnAPSO-34 was obtained by hydrothermal synthesis. We have observed the nanoporous material by SEM, looking for the morphology of the crystals. SEM images show the typical Chabazite morphology: Cubic crystals are well-developed in the size range of 3-10 μm. The XRD patterns illustrate the rather high crystallinity of all samples. No extra peak related to transition metal oxides appeared, indicating the purity of the products. The SEM-EDX data were measured randomly across different crystals and in different areas on different crystals. The presence of elemental Zn, on the cubic surface of the ZnAPSO-34 crystallites, was confirmed by using the EDX technique.

2.Various parameters were studied to evaluate the adsorption capacity of ZnAPSO-34 nanoporous material for the removal of MB from aqueous solutions. The results showed that ZnAPSO-34 could be employed as an alternative for the removal of dyes from aqueous solutions.

Biography

Lounis Azzeddine is titular diploma of Master and Doctorate (Ph.D. degree 1996) in Nuclear Engineering (Algiers University). At present, he is a Professor of Material Science and Engineering at Algiers University. In the field of research, he is a Director of research at the Laboratory of Sciences and Material Engineering. He works in the following specialities: Hydrometallurgy of uranium ores, treatment of waste waters by membrane technology, chemical degradation, photodegradation, behaviour of polymer under irradiation, and material properties (corrosion). The works of research are published by around fifty publications and international communications.

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