Synthesis and Modification of Zeolite Beta for Studying Aggregated Species

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In this study, zeolite beta with three dimensional structure was synthesized using hydrothermal method by tetraethyl ammonium hydroxide as template[1]. The mesoporous form of the zeolite was obtained by post-synthesis method by adding a surfactant structure-directing agent into a suspention containing the previousely synthesized zeolite. Functionalizing process was done with 3-aminopropyl trimethoxysilane (APTMS) to react effectively with the silicon groups of the surface of zeolite beta in order to provide different space and environment for the loaded species [2]. Methylene blue (MB) was loaded into both in the original microporous and mesoporous zeolite [3]. The effect of functionalization and in the original and mesoporous zeolite beta in the final product were investigated in terms of the loaded amount and some structural features such as monomeric and dimeric forms of the dye (i.e. MB). The prepared materials were characterized by X-ray diffraction, scanning electron microscopy, FT-IR, BET, diffuse reflectance spectroscopy and field effect scanning electron microscopy. There are some differences in relative amount of the different monomeric or protonated forms of the dye upon the structure. we found that there is a special space in zeolite beta that convert MB^+ to MB^{2+} which is absent in the mesoporous zeolite beta. The details will be demonstrated in the poster provided.

Keywords: Zeolite Beta, Functionalizing, dyes, Loading, Mesoporous formation

References

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