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• Search: Synthesis of Zinc phthalocyanines within Zeolites

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Synthesis of Zinc phthalocyanines within Zeolites

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Efficient oxidation catalysts are critical for advancing technologies such as fuel cells and carbon dioxide reduction. Transition metal phthalocyanines, such as zinc phthalocyanine (ZnPC) and zinc perfluorophthalocyanine (ZnF₁₆PC), show promise due to their catalytic potential, despite challenges from aggregation-induced activity loss. This research focuses on synthesizing ZnPC and ZnF₁₆PC within zeolite Na-X (FAU) to leverage the zeolite's confined environment to prevent aggregation and enhance the catalytic performance. Experimental methodologies encompass ion exchange and melt synthesis techniques to synthesize ZnPC and ZnF₁₆PC within the zeolite matrix. Initial results demonstrate successful synthesis of ZnPC and ZnF₁₆PC in/on zeolite CBV780, based on characterization by diffuse reflectance UV-Vis spectroscopy. To confirm that the phthalocyanines are made within the zeolite rather than on the outside of the zeolite, extensive washing using Soxhlet extraction is used to remove all phthalocyanines formed on the exterior of the zeolite. There are four fluorines in each phthalonitrile mol., and four phthalonitriles make a phthalocyanine, hence there are 16 fluorine atoms in a phthalocyanine; "hexadecyl fluorophthalocyanine" would be correct, but is a mouthfull; hence perfluorophthalocyanine.

Conference

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Conference; Meeting Abstract

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