



## Zeolite Y from rice husk ash encapsulated with Ag-TiO<sub>2</sub>: characterization and applications for photocatalytic degradation catalysts

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Received 24 December 2012; Accepted 9 February 2013

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### ABSTRACT

A high level of efficiency in the photocatalytic reactions was achieved by increasing the surface area of the photocatalyst by supporting fine TiO<sub>2</sub> particles on porous materials. Among various supports, zeolites seem to be an attractive candidate. Ti-incorporated Y zeolite was prepared by an ion-exchange method, while Ag was immobilized on the encapsulated titanium via impregnation method. The produced samples were characterized using X-ray diffraction, ultraviolet and visible spectroscopy, photoluminescence emission spectra, scanning electron microscopy, and surface area measurement. Furthermore, the catalytic performances of Ti-Ag/NaY tests were carried out for degradation of cyanide using visible light. The results reveal a good distribution of Ag on the zeolite. Ag doping can eliminate the recombination of electron-hole pairs in the catalyst. These results demonstrate that the optimum weight% of Ag to Ti-NaY is 0.3%; this weight% facilitates high performance by the photocatalyst, degrading 99% of cyanide in a 100 mg/L solution in 60 min.

*Keywords:* Rice husk ash; Ion-exchanged zeolite; Cyanide

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