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## COMPARATIVE STUDY OF STICKY RICE STARCH AND POLYVINYLPIRROLIDONE AS TEMPLATES FOR ZnO AND Ce-ZnO SYNTHESIS

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### Abstract

Sticky rice starch (S) as a bioorganic template, and polyvinylpyrrolidone (P) as a polymeric template were studied for the synthesis of ZnO and Ce-ZnO photocatalysts by the simple chemical method. Solid precursors were calcined at 550°C for 3 hrs as determined from the thermal decomposition and crystallization of the photocatalysts by TGA-DTA. Based on their physico-chemical properties characterized by FT-IR, FT-Raman, XRD, BET surface area, SEM, UV-Vis DRS, and zeta potential, there was no significant difference in these properties for catalysts obtained from both templates. The catalyst powder was immobilized on alumina beads via the mechanical coating technique (MCT) and applied to the photocatalytic degradation of atrazine. Under visible light irradiation, the Ce-ZnO obtained from template S showed an enhancement of the photocatalytic degradation (~5.47–11.54%), which is highly dependent on the molar ratio (Ce/Zn) and pH. Sticky rice starch could be regarded as an environmental friendly alternative template for ZnO and Ce-ZnO synthesis. The catalyst addresses the entrainment in photocatalytic reactor, eliminating the need for a post filtration process.

*Key words:* biomaterial, mechanical coating, simple chemical method, ZnO

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