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Supporting Information

Versatile Sulfathiazole Functionalized Magnetic Nanoparticles as Catalyst in Oxidation and Alkylation Reactions

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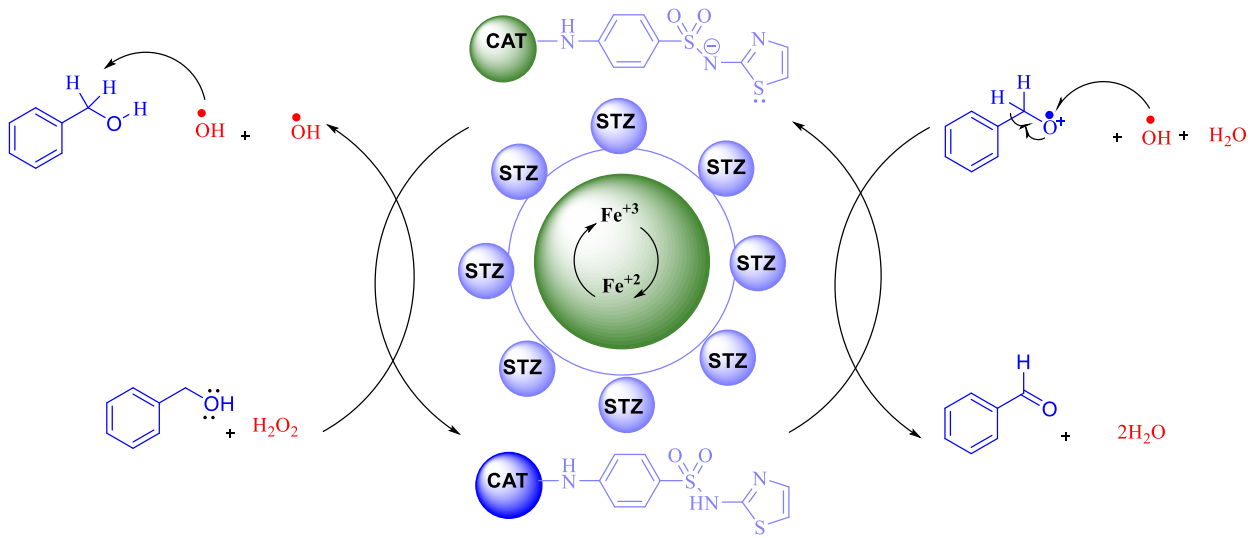
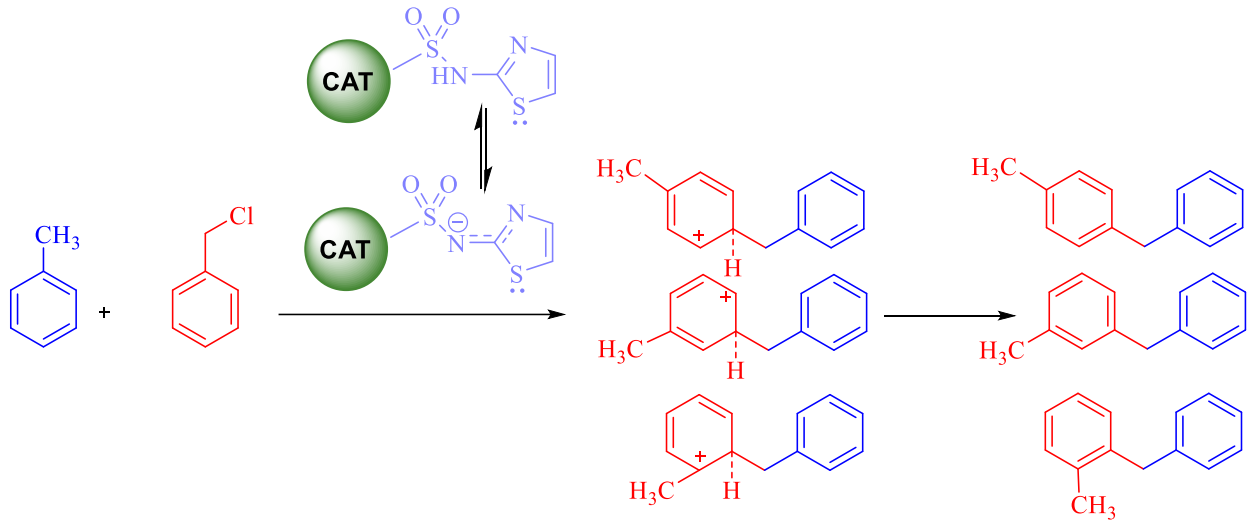
Abstract: Catalyst design and surface modifications of magnetic nanoparticles have become attractive strategies in order to optimize catalyzed organic reactions for industrial applications. In this work, silicacoated magnetic nanoparticles with a core-shell type structure were designed. The obtained material was successfully functionalized with sulfathiazole groups, which can enhance its catalytic features. The material was fully characterized, using a multitechnique approach. The catalytic performance of the as-synthesized material was evaluated in 1) the oxidation of benzyl alcohol to benzaldehyde and in 2) the microwave assisted alkylation of toluene with benzyl chloride. Remarkable conversion and selectivity were obtained for both reactions and a clear improvement of the catalytic properties was observed in comparison with the unmodified γ-Fe_2O_3/SiO_2 and γ-Fe_2O_3. Noticeable, the catalyst displayed outstanding magnetic characteristics which facilitated its recovery and reusability.

Keywords: γ-Fe_2O_3, sulfathiazole, maghemite, core-shell, benzyl alcohol oxidation, alkylation.



Scheme S1. Illustration of the proposed mechanism for the oxidation reaction.



Scheme S2. Proposed mechanism of the alkylation reaction.

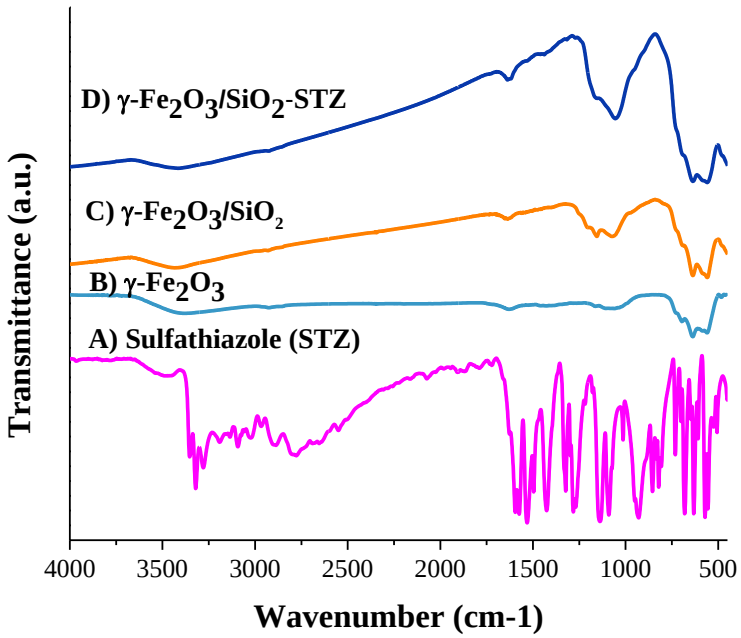


Figure S1. FT-IR spectra of the prepared materials of A) Sulfathiazole (STZ), B) γ-Fe_2O_3, C) γ-Fe_2O_3/SiO_2, and D) γ-Fe_2O_3/SiO_2-STZ.