

P46: Preparation and characterization of a new iron-tungsten phosphate Catalytic activity in the oxidation of cyclohexane to cyclohexanol

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Abstract:

In the last few years, the metallophosphate chemistry was extensively investigated in order to obtain materials with a wide range of applications. Among them, those with transition metals aroused the strongest interest due to their potential applications in non-linear optic, ion exchange, ion conductivity and catalysis.

We report herein the synthesis of a bimetallic iron-tungsten phosphate that was obtained hydrothermally, by using N,N'-dimethyl piperazine as the structure directing agent.

The solid material was characterized by several physico-chemical techniques such as: X-ray diffraction, chemical and thermal analyses, scanning electron microscopy, N₂ adsorption isotherms and FTIR and Mössbauer spectroscopies.

In the aim of evaluating the performance of this product as heterogeneous catalyst, we tested it in a probe reaction for the oxidation of cyclohexane, with hydrogen peroxide as oxidant.

The reaction was carried out at 70°C for 6h, using cyclohexanol and methyl ethyl ketone as initiators.

The results of the study showed that the material exhibited a high catalytic activity.

Moreover, it was observed a more marked activity when the reaction was carried out with cyclohexanol as initiator, when compared to methyl ethyl ketone.

Keywords: Hydrothermal synthesis, Catalyst, Iron-tungsten phosphate, Oxidation, Transition metal