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Application of AgNPs-doped MIL-53 in the catalytic reduction of methylene blue MB dye

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A B S T R A C T

This work focuses on the preparation of MIL-53 material by the hydrothermal route. The obtained material was used as a support for AgNPs (silver nanoparticles). Several percentages of AgNPs (0.5%, 1%, 2%, and 3%) were dispersed on the surface of MIL-53 to study their catalytic behaviour. The obtained solids were characterised by different methods to determine their physicochemical properties. The parent material and its AgNPs-modified counterparts were tested as catalysts for the catalytic reduction of MB dye in the presence of NaBH₄. The results clearly showed the presence of AgNPs on the surface of MIL-53 after chemical modification. The results showed that the reduction of MB is favoured by catalysts with a high content of AgNPs. A high conversion of MB dye to Leuco-MB was obtained in a reaction time not exceeding 5 min.

Keywords: MIL-53; AgNPs; MB dye; catalytic reduction

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