Self-assembly of poly ionic liquid-polyoxometalate on the surface of graphene oxide applied for deep desulfurization

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Abstract

A series of polymer ionic liquid (PIL)-based polyoxometalate (POM) salt is and synthesized through self-assembly method. Whereafter, supported catalysts are prepared by adding graphene oxide during the self-assembly process. The presence of polymer ionic liquid of hybrid not only can increase the lipophilicity via abundant carbon chains, but also immobilized the hybrid on the surface of GO through specific π-π complexation, improving the stability during desulfurization process. Two group materials are characterized and used as catalysts for the removal sulfides in oil. By contrast, the supported catalyst has better performance. Then, the response surface methodology is used to analyze the influence of reaction conditions on removal thiophene and explore the optimum conditions. And the maximum sulfur removal efficiency of T, BT and DBT can achieve to 98.47, 99.98 and 99.28 %, respectively. Besides, the catalyst can be easily recovered and reused without significant decrease in activity after ten cycles.

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