

عنوان مقاله:

Investigation of Effect of Solvent and Counter-Anion on the Desulfurization Capacity of UVM-10

محل انتشار:

اولین کنفرانس ملی نانو از سنتز تا صنعت (سال: 1396)

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خلاصه مقاله:

Method of embedding of metallic nanoparticles on a support, i.e. silica and alumina can influence the performance of the synthesized adsorbent in many reactions and applications, namely adsorptive desulfurization [1–5]. In this study, UVM-10 was synthesized and characterized with XRD, SEM and TEM. After that, effect of different solvents with different protic and polarity were used for the wet impregnation of UVM-10 with copper salt. Among ten solvents, Ethanol, THF and DMF had the highest adsorption yield up to 48% and acetone had the lowest yield. Among different copper salts, acetate had better desulfurization yield than nitrate. XRD patterns showed that the mesoporous structural order remain almost intact after doping with metallic nanoparticles. On the other hand, H₂O as the most used solvent in catalyst/adsorbent preparation has 39% yield which is considerably lower than that of the organic solvents. This phenomenon can be more important in case of the use of expensive metals such as palladium, platinum, gold, etc. This higher adsorption capacity might be due to the two effects, first, different form of crystallite structure of nanoparticles and second dispersion of them. After that, effect of main factors including adsorbent dosage, time and metal content were also investigated. It was found that the adsorbent dosage has the highest effect and time has the lowest effect. Interference of aromatic compounds on the desulfurization yield showed that toluene interrupt the adsorption but, when using naphta, decrease on desulfurization yield is somehow low. The highest efficiency for heptane and naphta, were reached to 70% and 44%, respectively. Recovery of the used adsorbent was also investigated. Among thermal and solvent recovery, the latter has the best efficiency and the former, using acetone, has the middle efficiency, respectively.

کلمات کلیدی:

UVM-10, Desulfurization, THF, DMF

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