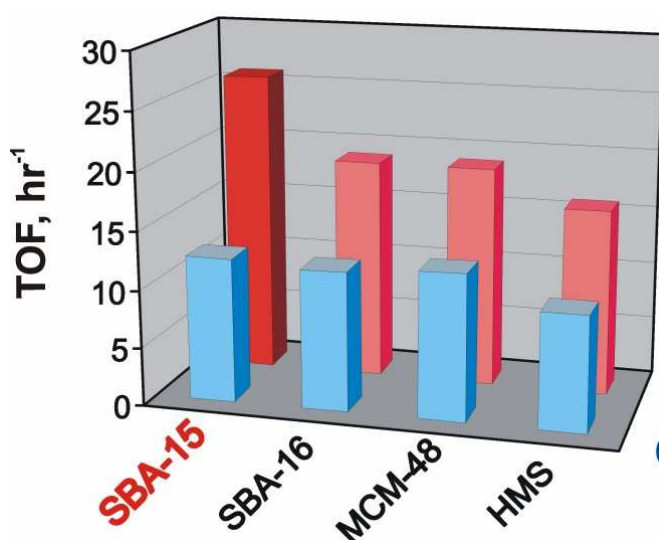


Study of vanadium based mesoporous silica for oxidative dehydrogenation of propane and n-butane

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Abstract: The comparative study of catalytic performance of V-containing high-surface mesoporous siliceous materials (HMS, SBA-16, SBA-15 and MCM-48) in oxidative dehydrogenation of propane and *n*-butane (C3-ODH and C4-ODH, respectively) was carried out. The aim of study was to investigate effect of silica support texture on the speciation of vanadium complexes and its impact on catalytic behavior in both above mentioned reactions is reported. Prepared catalysts were characterized by XRF for determination of vanadium content, XRD, SEM and N₂-adsorption for study of morphology and texture, and H₂-TPR and DR UV-vis spectroscopy for determination of vanadium complex speciation. All prepared materials were tested in propane and *n*-butane ODH reaction at 540 °C and obtained catalytic results were correlated with their structural and surface characteristics. On the basis of obtained data we conclude that the structure of mesoporous silica support plays decisive role in the case of application of catalysts in *n*-butane ODH reaction, whereas catalytic performance of investigated catalysts in propane ODH reaction is comparable for all investigated structures. Catalytic performance of investigated materials in C3-ODH and C4-ODH can be correlated with population of all tetrahedrally coordinated VO_x complexes and only isolated monomeric VO_x complexes, respectively.