

Heteropolyacids@Silica heterogeneous catalysts to produce solketal from glycerol acetalization

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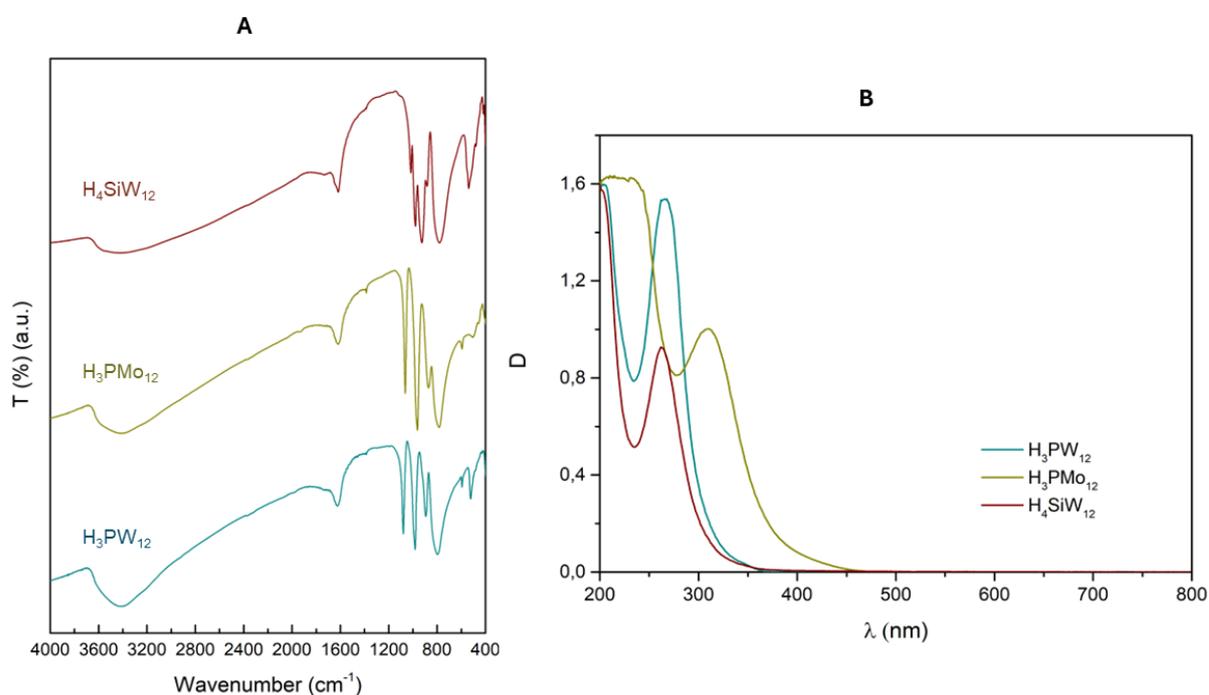


Figure S1. (A) FTIR spectra of H_3PMo_{12} , H_3PW_{12} and H_4SiW_{12} . (B) UV-Vis. absorption spectra of H_3PMo_{12} , H_3PW_{12} and H_4SiW_{12} , in acetonitrile.

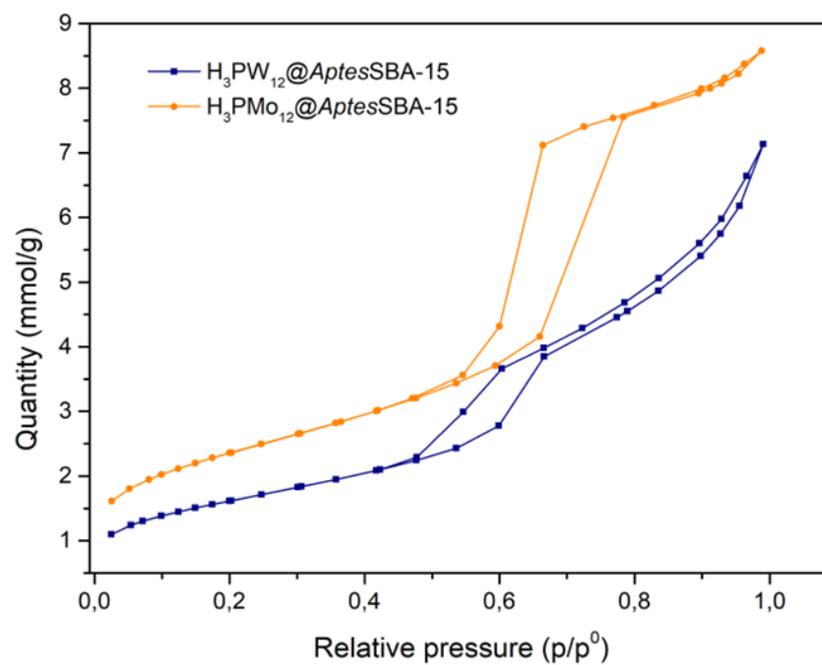


Figure S2. Nitrogen adsorption-desorption isotherms of the prepared $H_3PW_{12}@AptesSBA-15$ and $H_3PMo_{12}@AptesSBA-15$ composites.

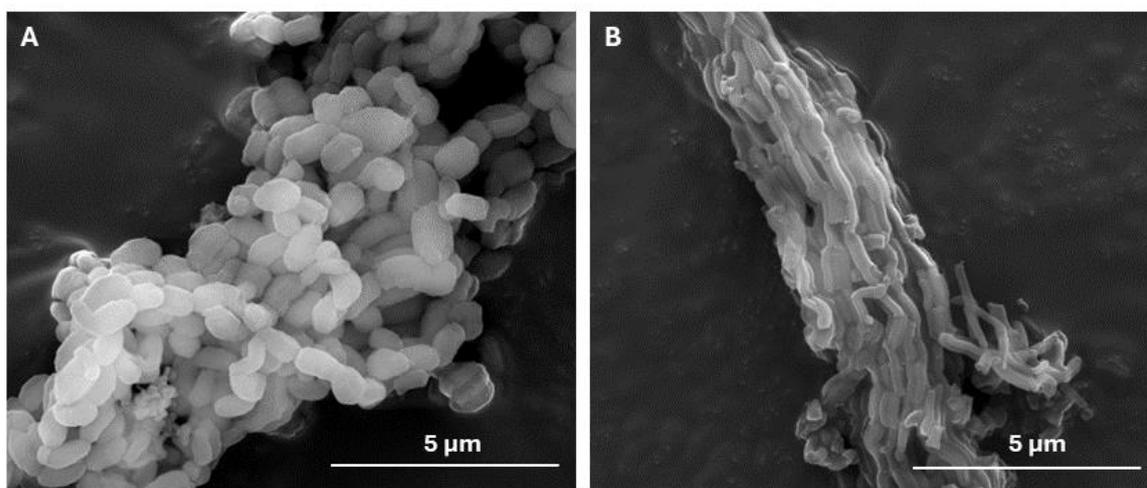


Figure S3. SEM images obtained for A) SBA-15 and B) *Aptes*SBA-15.

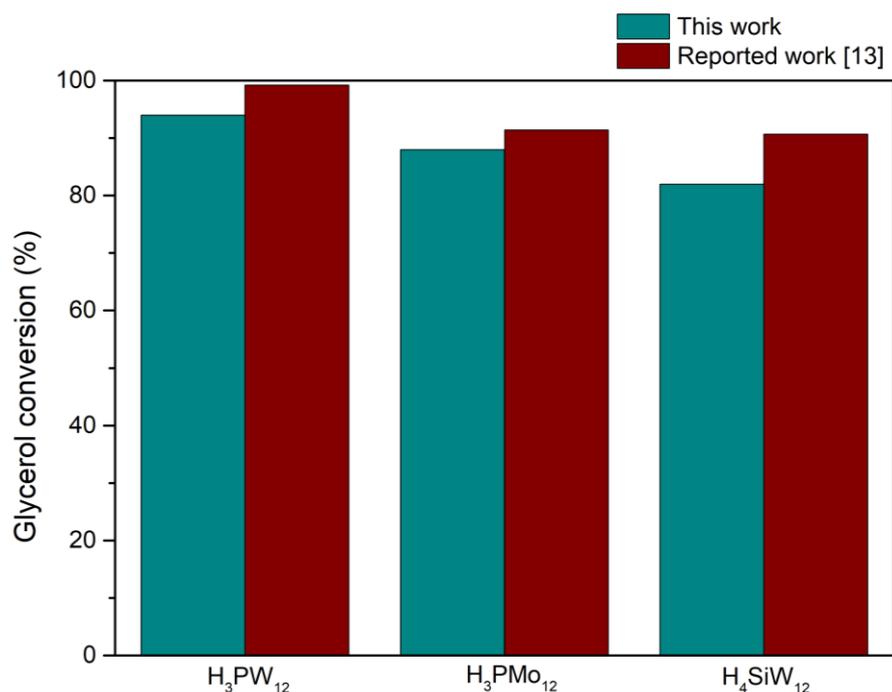


Figure S4. Comparison of the glycerol conversion results obtained using three different homogeneous catalysts (H_3PMo_{12} , H_3PW_{12} and H_4SiW_{12}). Results of the reported work of Julião et al. (reference [13] in the manuscript) obtained at 1:15 glycerol/acetone ratio, using 3 wt% of catalyst (compared to glycerol weight), at 25 °C after 5 min of reaction. Results of this work obtained at 1:15 glycerol/acetone ratio, using a normalized catalyst acidity of 0.373 mmol H^+ /g, at 25 °C after 5 min of reaction.

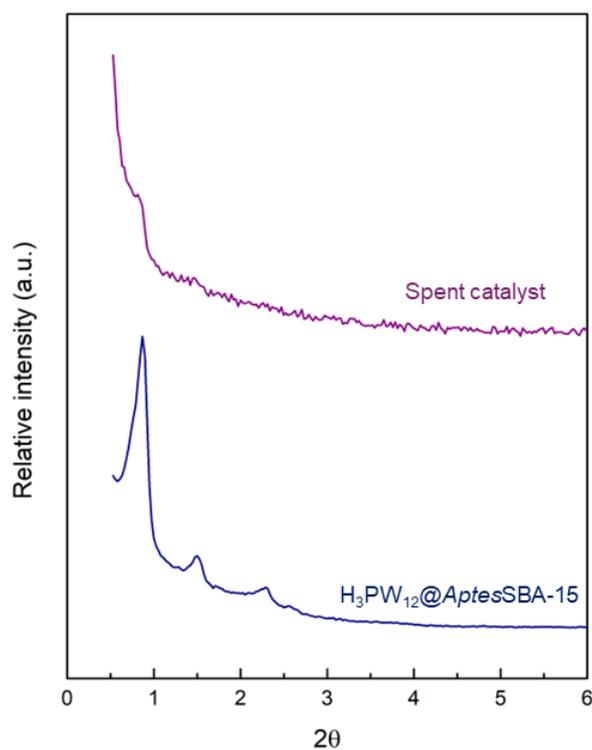


Figure S5. Powder XRD patterns for $H_3PW_{12}@AptesSBA-15$ before catalysis and the spent $H_3PW_{12}@AptesSBA-15$ catalyst after four catalytic cycles.

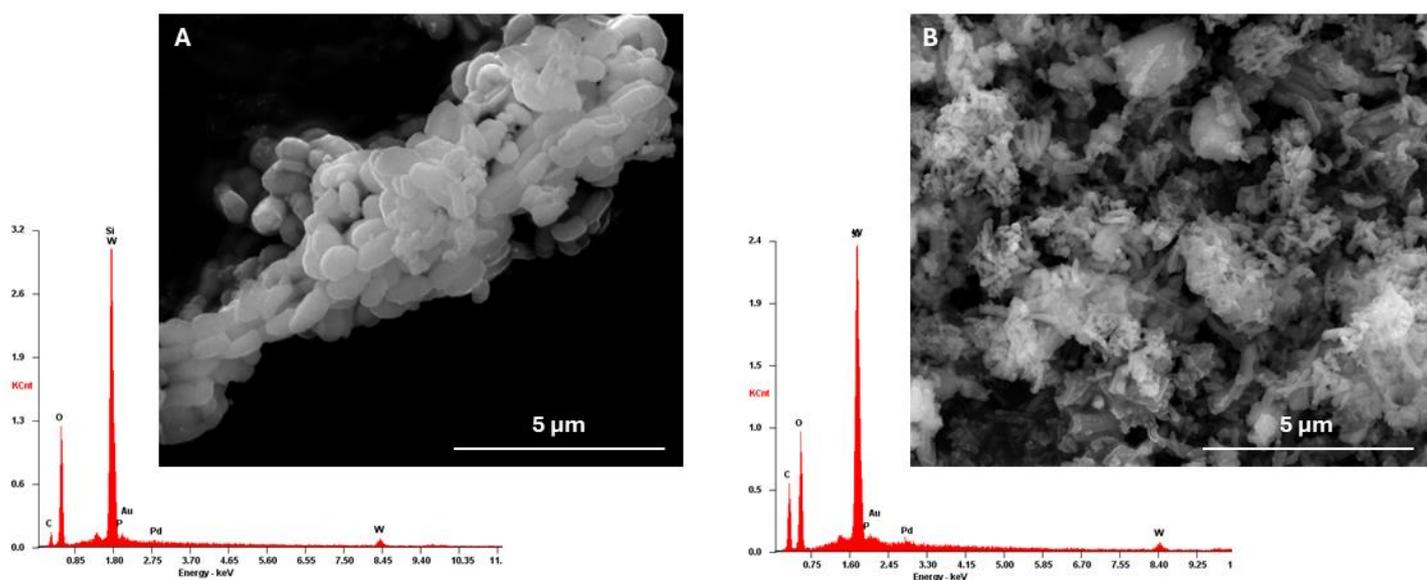


Figure S6. SEM images and EDS spectra obtained for A) $\text{H}_3\text{PW}_{12}@Aptes\text{SBA-15}$ before catalytic use and B) spent $\text{H}_3\text{PMo}_{12}@Aptes\text{SBA-15}$, after four cycles.