

$\text{H}_3\text{PW}_{12}\text{O}_{40}/\text{SBA-15}$ for the solventless synthesis of 3-substituted indoles

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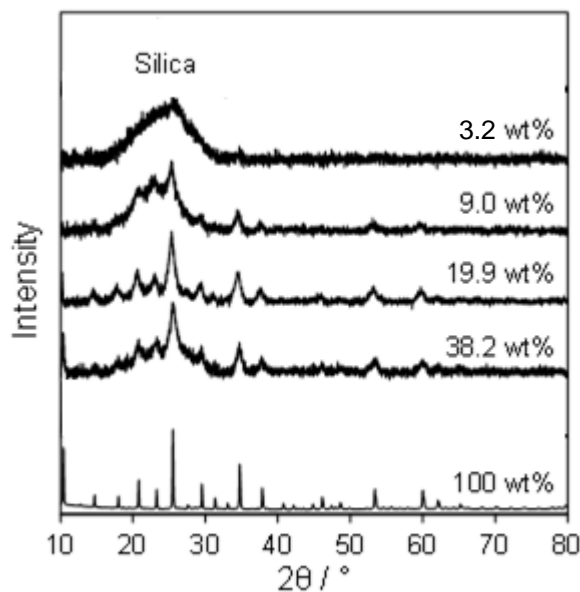


Figure S1. Powder XRD patterns for HPW/SBA-15 as a function of W loading, together with a pure HPW reference.

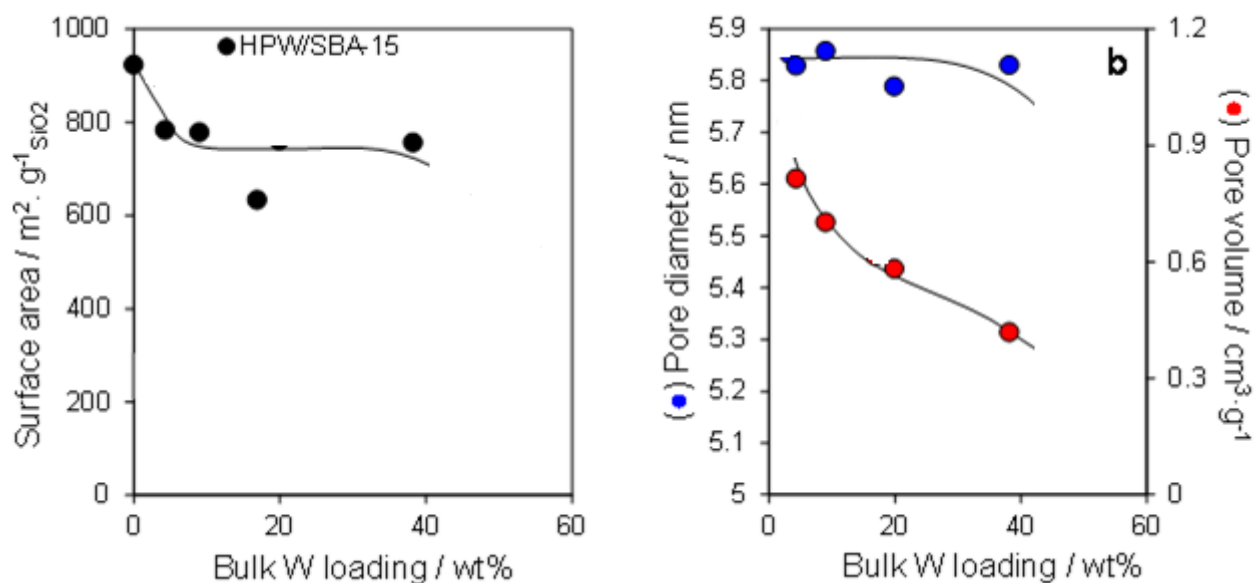


Figure S2. Variation of (a) surface areas of HPW/SBA-15 and (b) mesopore diameter and mesopore volume of HPW/SBA-15 as a function of bulk W loading.

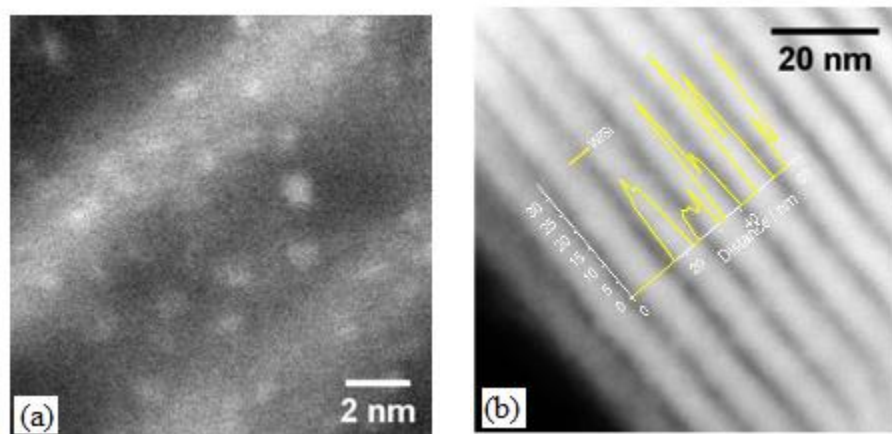


Figure S3. HRTEM dark-field images of 3.2 wt% HPW/SBA-15 (a) and 51.6 wt% HPW/SBA-15 (b). Inset shows the corresponding EDX profile.

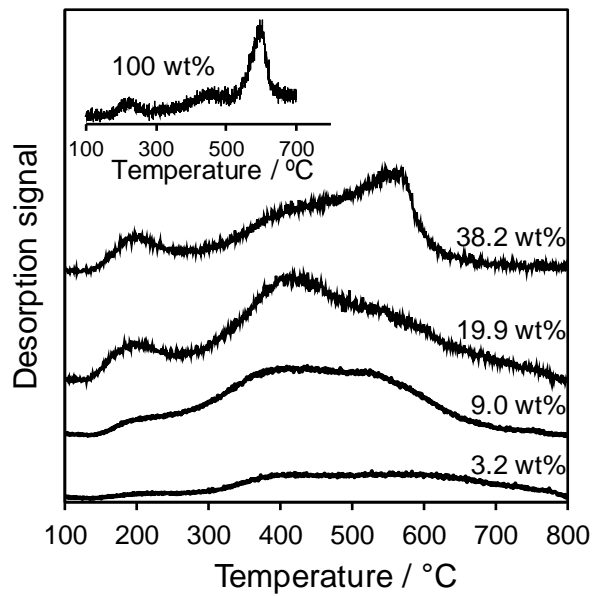


Figure S4. NH_3 TPD spectra for HPW/SBA-15 as a function of W loading. Inset shows corresponding desorption spectrum for pure HPW.

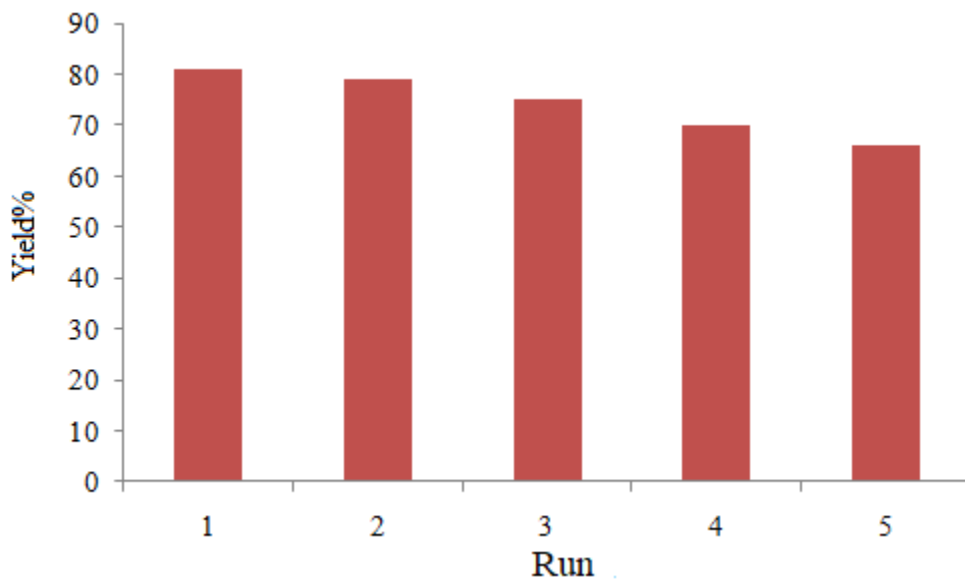


Figure S5. Indole yield over 51.8 wt% HPW/SBA-15 as a function of recycle. Reaction condition: benzaldehyde (1 mmol), malononitrile (1 mmol), and indole (1 mmol); 60 °C; 20 min; 5 mg catalyst.

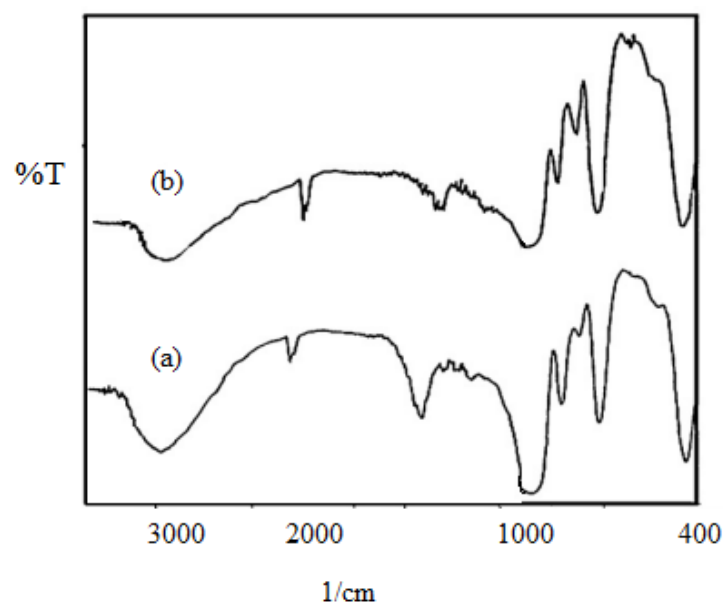


Figure S6. FT-IR spectra of 51.8 wt% HPW/SBA-15 (a) as-prepared, and (b) after 5 consecutive reactions.

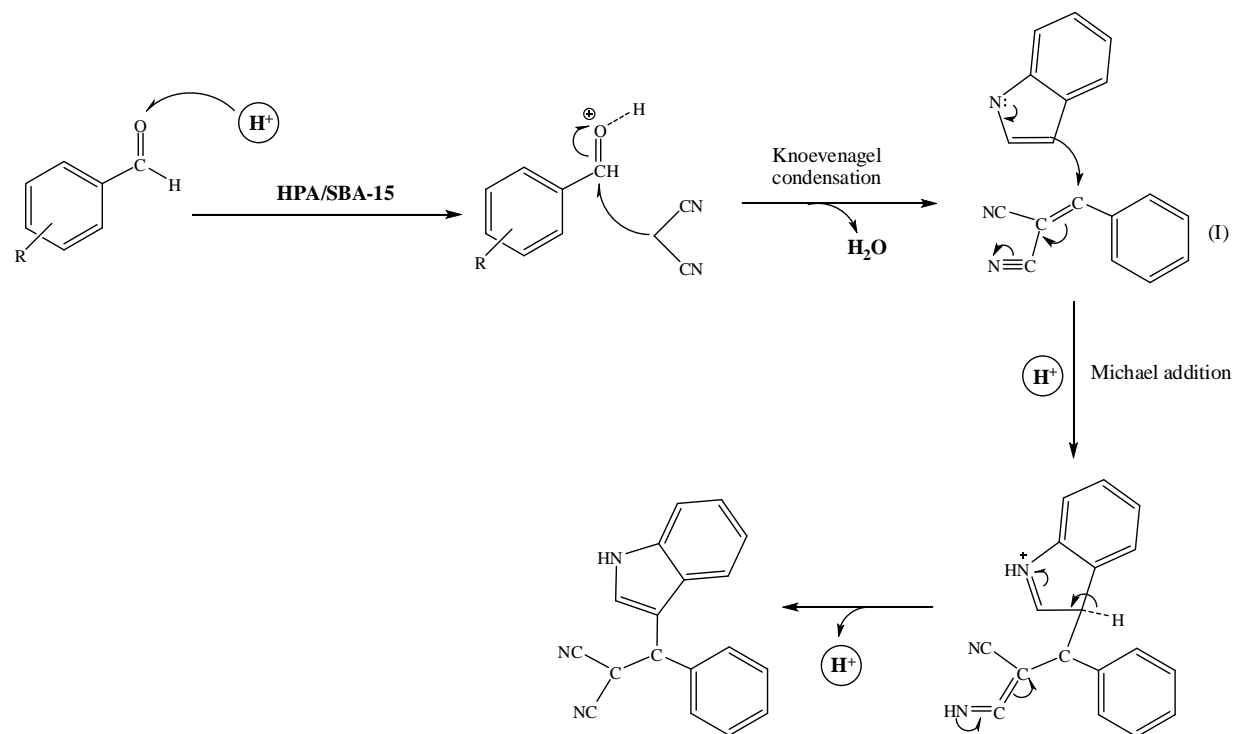


Figure S7. Proposed reaction pathway for the three-component condensation reaction.

Reference: Frattini, L.; Isaacs, M. A.; Parlett, C. M.; Wilson, K.; Kyriakou, G.; Lee, A. F. Support enhanced α -pinene isomerization over HPW/SBA-15. *Appl. Catal. B: Environ.* **2017**, *200*, 10.