

SYNTHESIS AND CHARACTERIZATION OF TUNGSTOPHOSPHORIC ACID-MODIFIED MESOPOROUS SILICA NANOPARTICLES WITH TUNEABLE DIAMETER AND PORE SIZE DISTRIBUTION

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General procedure for the synthesis of 2,3-diphenylpyrido[2,3-b]pyrazine using MSN1TPA_c and MSN6TPA_c as catalysts

A mixture of 1,2-diaminobenzene (1.2 mmol) and 2,3-diamine pyridine (1.2 mmol), and MSN_XTPA_c (60mg) was stirred at 80 °C for the time necessary to complete the reaction.. Completion of the reaction was indicated by TLC. The reaction mixture was cooled to 25 °C, toluene (5 mL) was added, and then the mixture was stirred for 15 min and filtered to separate the catalyst, which was subsequently washed twice with toluene (3 mL). The combined toluene extracts were washed twice with water (5 mL), dried over anhydrous Na₂SO₄, and evaporated in vacuo. The solid obtained was recrystallized from ethyl alcohol to afford the pure quinoxaline derivative.

Figure S1. ^{31}P MAS NMR spectra of MSN1TPA_c (a), MSN3TPA_c (b), and MSN6TPA_c (c) samples.

