Supporting Information for:

**Selective Oxidation of Sulfides to Sulfoxides Using 30% Hydrogen
Peroxide Catalyzed with a Recoverable Silica-Based Tungstate
Interphase Catalyst**

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***Experimental Procedures, Physical Data of the Catalysts and
Products***

Stage 1, Preparation of AMPS : Mesoporous silica gel (average pore diameter 60 Å) was activated by refluxing in concentrated hydrochloric acid (6 M) for 24 h and then washed thoroughly with the deionized water and dried before undergoing chemical surface modification. Refluxing the activated silica gel (10 g) with 3-aminopropyltrimethoxysilane (1.4 mmol) in dry toluene for 18 h. The solid materials were filtered off and washed with hot toluene for 12 h in a continuous extraction apparatus (Soxhlet) and then dried in oven at 110 °C overnight to give the surface bound amine (AMPS) group at a loading *ca.* 0.31 mmol g⁻¹

(by elemental analysis and back titration). The presence of amino group was characterized by DRIFT-IR (Figure 1.)

Preparation of surface bound ammonium triflate: The resulting AMPS (5g) were subject to react with two fold excess of $\text{CF}_3\text{SO}_3\text{H}$ in dry CH_2Cl_2 for 8 h and then filtered off and washed successively with CH_2Cl_2 , EtOH and Et_2O and then dried in a vacuum desicator at 40 °C overnight to afford surface bound ammonium triflate.

Stage 2, Preparation of Silica-Based Tungstate Interphase Catalyst 1: The catalyst was prepared by stirring a mixture of surface bound ammonium triflate (4 g) and an aqueous solution of three fold excess $\text{Na}_2\text{WO}_4 \cdot 2\text{H}_2\text{O}$ (1.3 mmol, 429 mg, Merck) in deionized water (75 mL) at room temperature for 24 h. After stirring the white solid was filtered off, washed with large volume deionized water (1 liter), ethanol and ether. It was then dried in an oven at 95 °C overnight to furnish the corresponding catalyst **1** at a loading *ca.* 0.31mmol g⁻¹ (Determined by TGA analysis (Figure 2). From the simultaneous XRF analysis of the catalyst for tungsten and sodium it is calculated that the loading of former in the solid was 0.15±0.01 mmol.g⁻¹ while a trace amount (less than 0.4 ppm) of the latter detected.

General experimental procedure: In a 100 mL round bottom flask, to a solution of sulfide (2 mmol) in 1:1 mixture MeOH/ CH_2Cl_2 (10 mL), 30% H_2O_2 (3-8 equivalent) and the catalyst **1** (2 mol%, 0.266 g) was added successively and the resulting slurry was stirred magnetically at room temperature for the indicated time in Table 1. The progress of the reaction was monitored by TLC and GC. After completion of the reaction (>99% GC conversion), the reaction mixture was filtered off and the catalyst rinsed twice with CH_2Cl_2 (25-30 mL) the excess of solvent was removed under reduced pressure to give the corresponding pure

sulfoxide (Table 1). In most cases, the purity of products was analyzed by GC to be more than 99% without any chromatographic purification. All reaction products are known, and gave satisfactory GC chromatogram and IR spectra as compared with those obtained from authentic samples.

Purification of di-*p*-tolyl sulfoxides and *p*-nitrophenyl phenyl sulfoxides: After usual work-up, the crude sulfoxides were chromatographed on silica gel using a solvent mixture hexane/ethyl acetate (10:1) as eluent to afford the corresponding pure adduct.

Figure 1. DRIFT-IR of Aminopropylsilica (AMPS)

Figure 2. TGA/DTG of Silica-Based Ammonium Tungstate