Oxidation of dibenzothiophene catalyzed by [C_{8}H_{17}N(CH_{3})_{3}]_{3}H_{3}V_{10}O_{28} using molecular oxygen as oxidant

Nanfang Tang, Yongna Zhang, Feng Lin, Hongying Lü, Zongxuan Jiang* and Can Li*

\textit{a} State Key Laboratory of Catalysis, Dalian Institute of Chemical Physics, Chinese Academy of Sciences, Dalian 116023, China.
\textit{b} Graduate School of Chinese Academy of Sciences, Beijing 100049, China. E-mail: zxjiang@dicp.ac.cn, canli@dicp.ac.cn
Supplementary Fig. 1. (a), FT-IR spectrum of reaction product; (b), FT-IR spectrum of reaction product, wavenumbers: 400 ~ 800 cm\(^{-1}\)
**Supplementary Fig. 2.** *In situ* ESR spectra of DMPO-O$_2$ adduct generated in the oxidative desulfurization process. (a) the sample tested without catalyst at 25 °C. (b) the sample tested without catalyst at 60 °C. (a’) the sample tested with catalyst at 25 °C. (b’) the sample tested with catalyst at 60 °C.
Supplementary Fig. 3. Effect of hydroquinone on ODS catalyzed by [C₈H₁₇N(CH₃)₃]₃H₃V₁₀O₂₈. ■: no hydroquinone; ▲: 5% hydroquinone; ▼: 20% hydroquinone.
Supplementary Fig. 4. ESR spectra of TEMPO-¹O₂. (a) the sample tested without catalyst at 25 °C. (b) the sample tested with catalyst at 25 °C. (c) the sample tested with catalyst at 60 °C. (d) the sample tested with catalyst at 80 °C.
**Supplementary Fig. 5.** The conversion of DBT vs. reaction time using O₂ or air.

Reaction condition: 40 mg Q₃H₇V₁₀O₂₈, 20 ml DBT/decalin (500ng µl⁻¹), 90 °C.