

Supporting Information

**Fe<sub>3</sub>O<sub>4</sub>@SiO<sub>2</sub> supported *aza*-crown ether complex cation ionic  
liquids: preparation and applications in organic reactions**

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## TGA of catalysts **5a** and **5b**

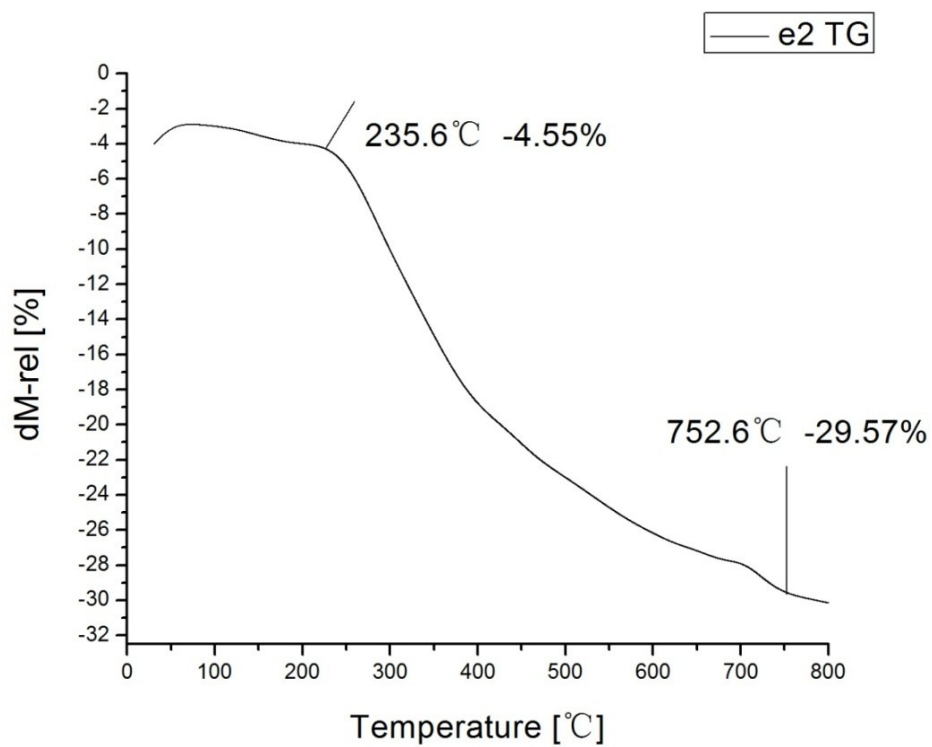


Fig. S1. The thermal gravity analysis **5a**

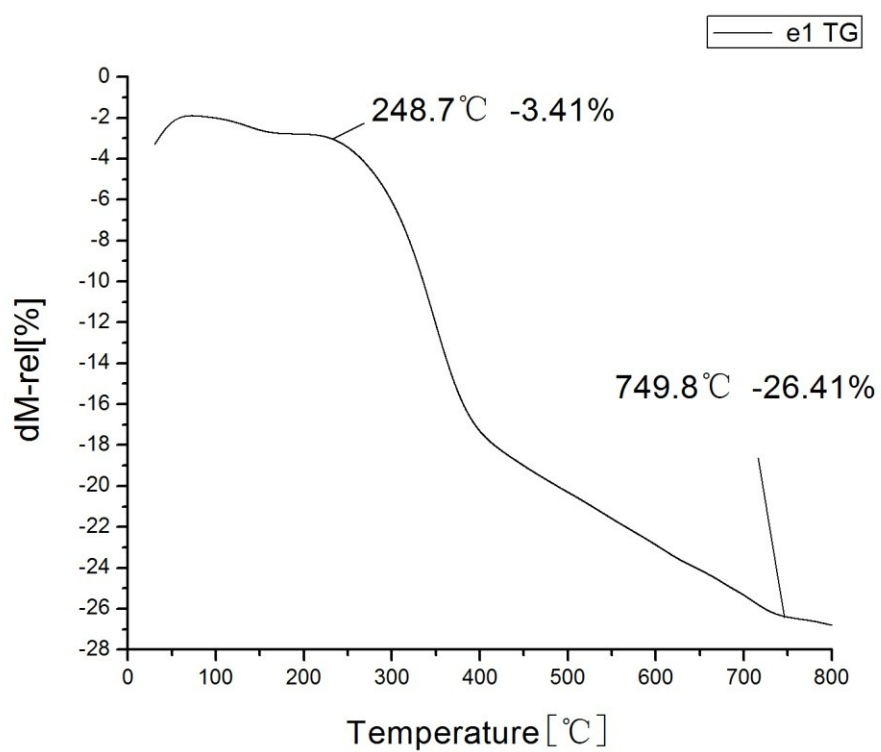


Fig. S2. The thermal gravity analysis **5b**

IR spectra of ILs

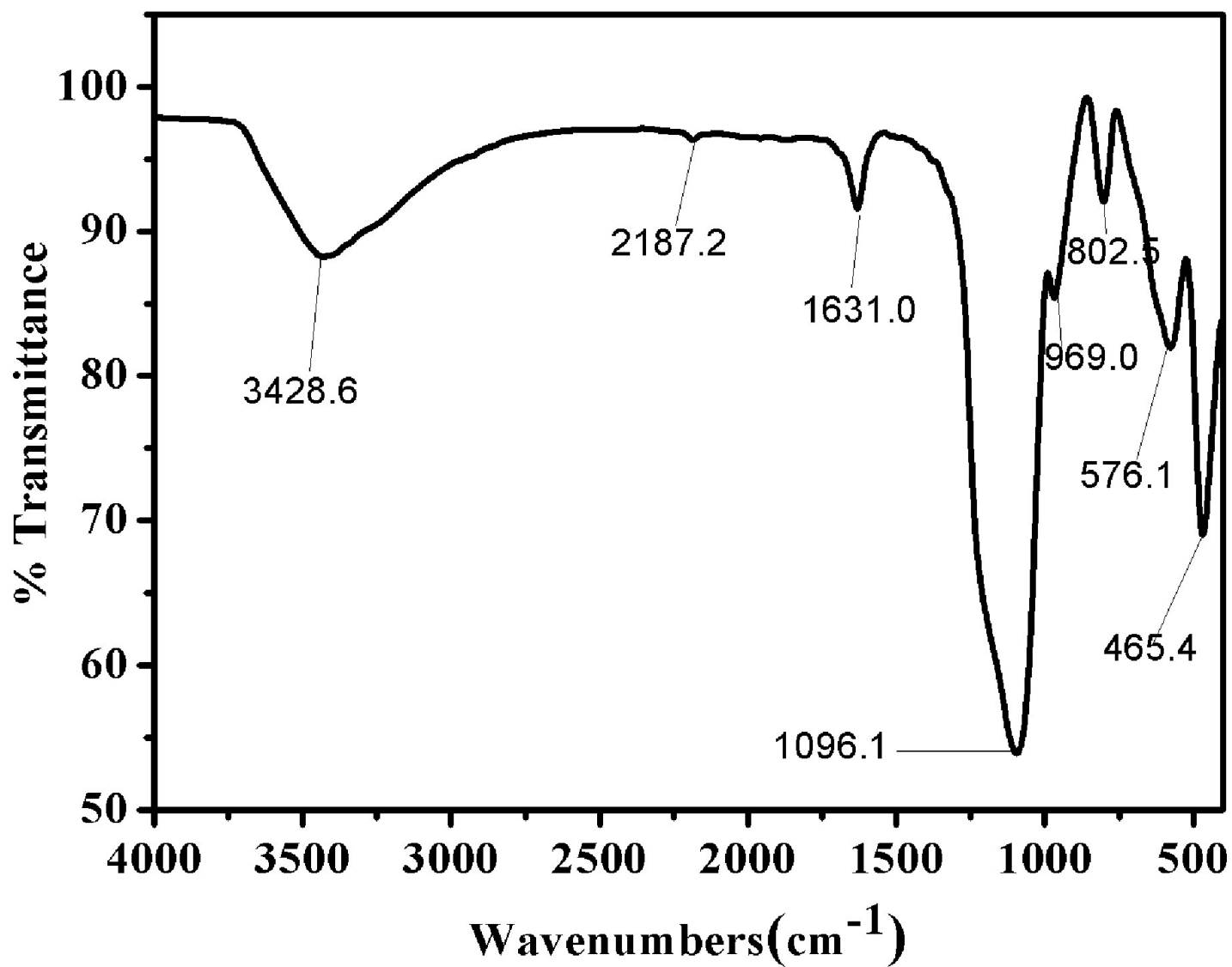


Fig. S3. Fe<sub>3</sub>O<sub>4</sub>@SiO<sub>2</sub> particles 2

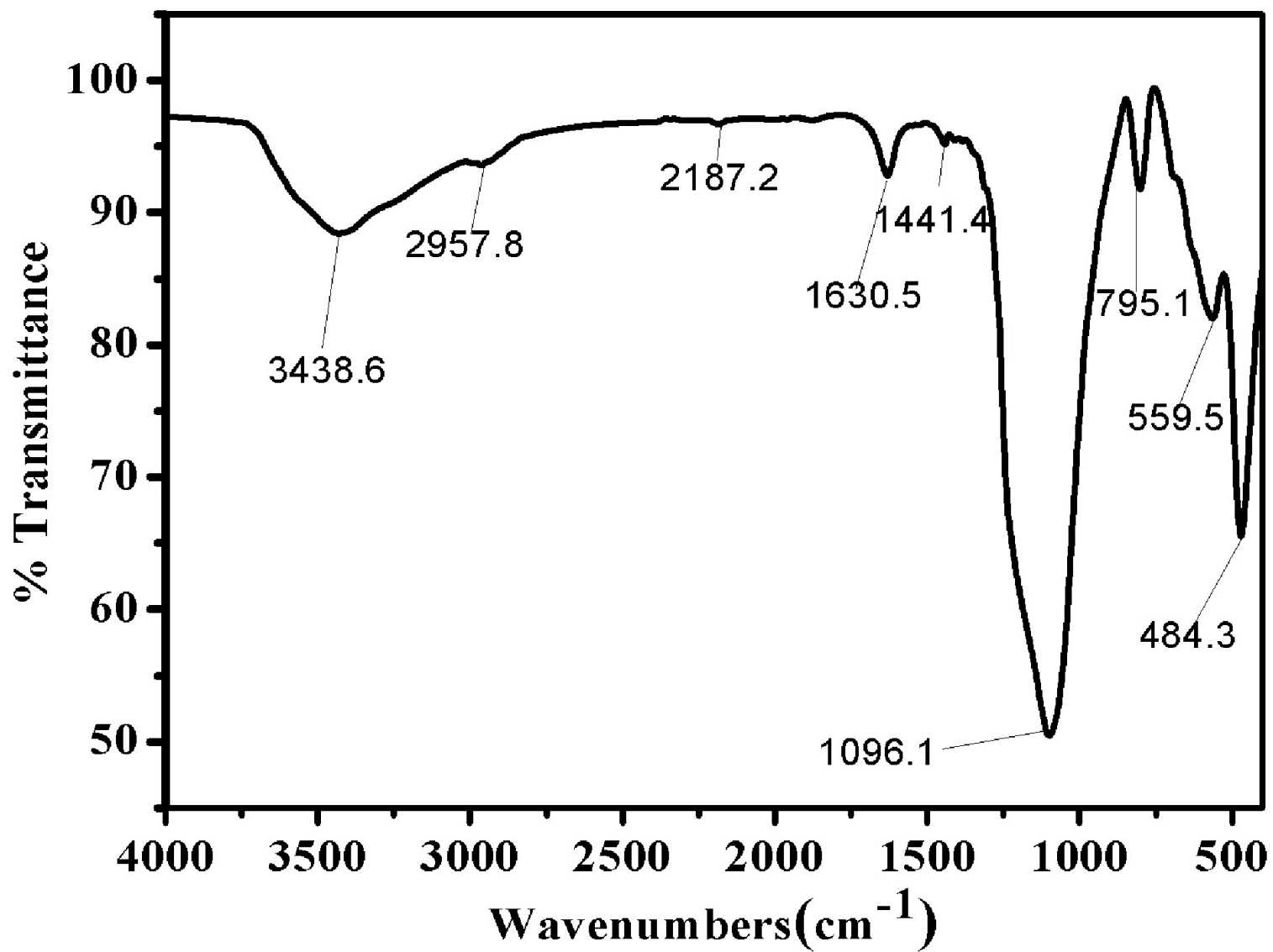


Fig. S4 Silane modified Fe<sub>3</sub>O<sub>4</sub>@SiO<sub>2</sub> particles 3

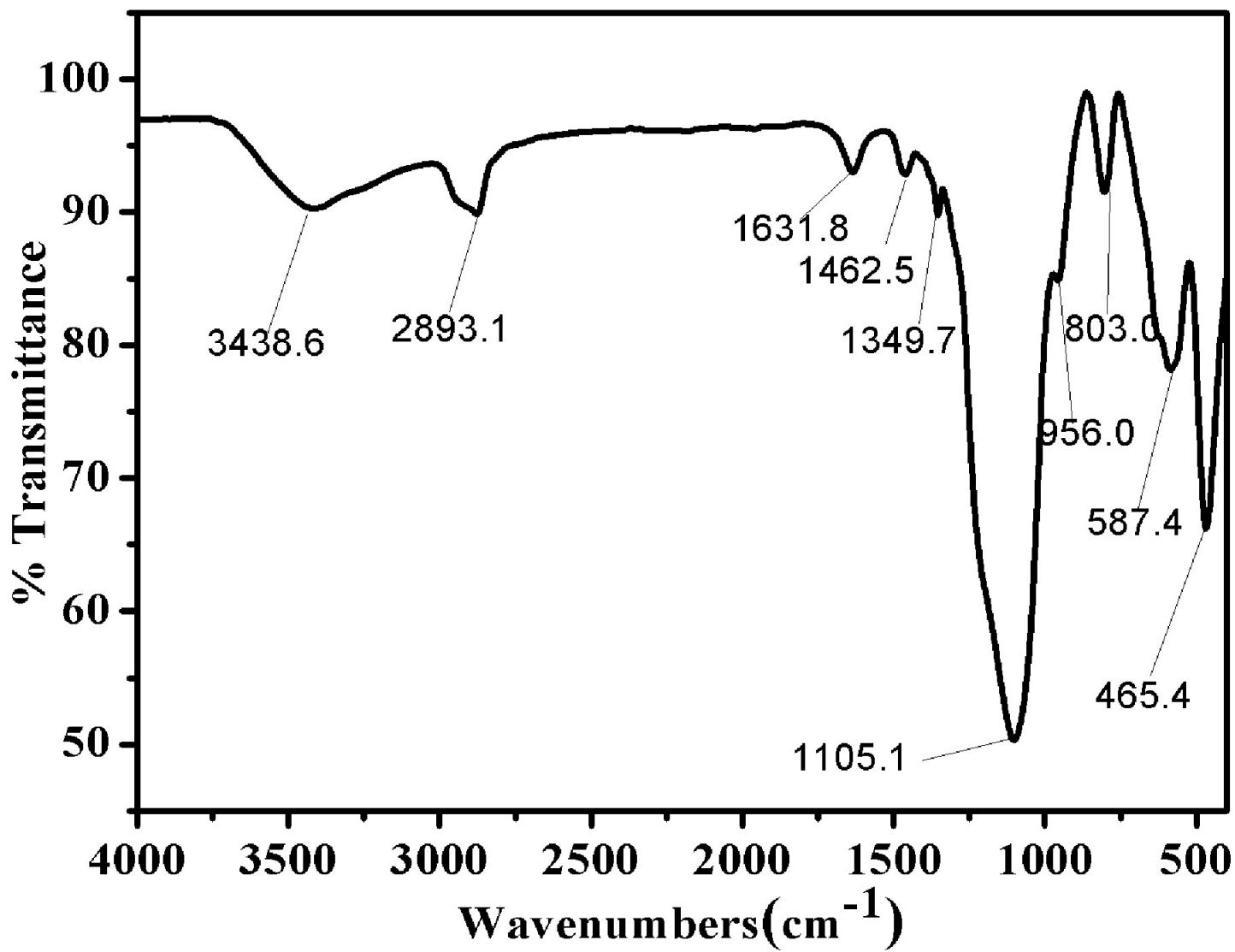


Fig. S5 *aza*-crown ether functionalized particles 4

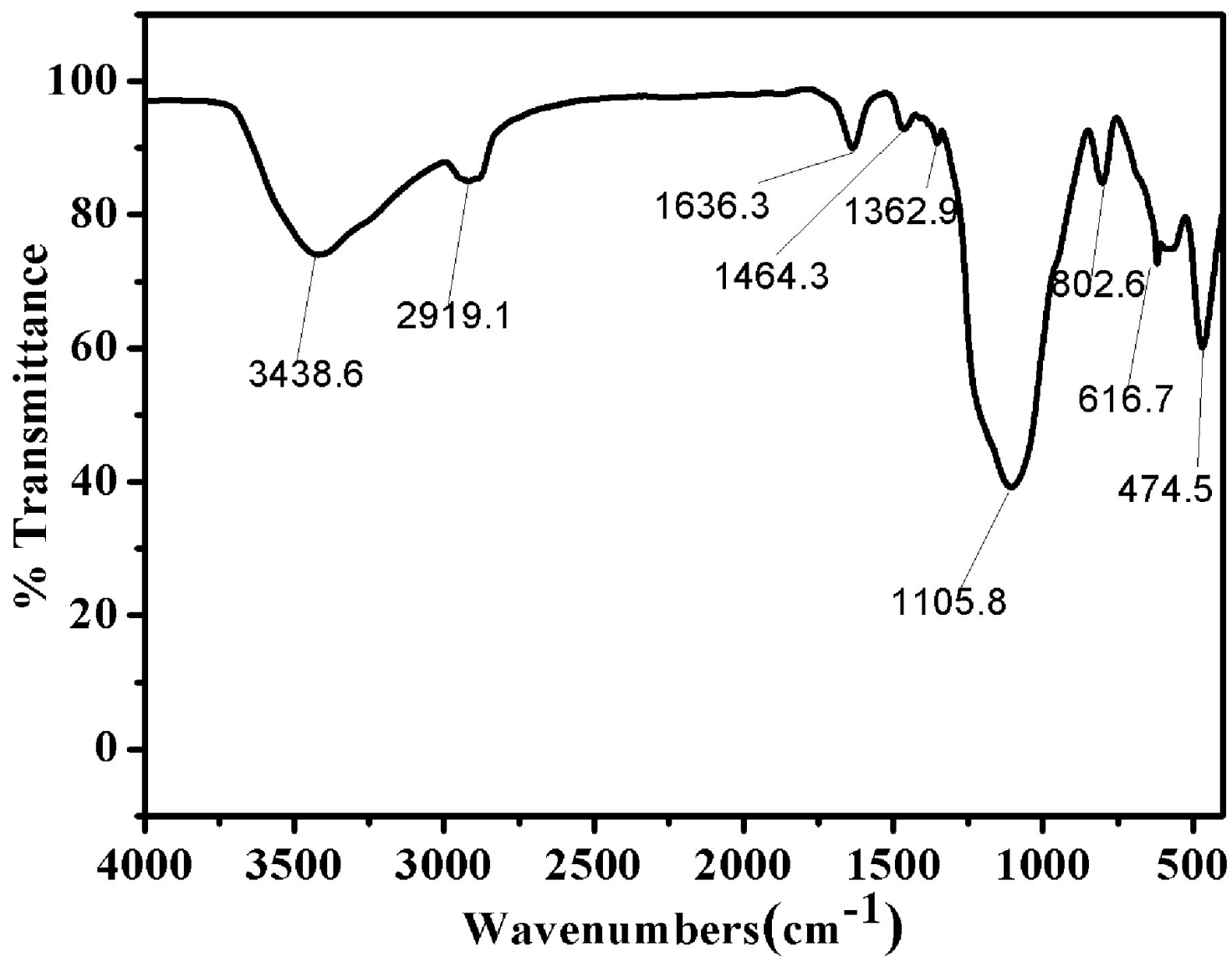
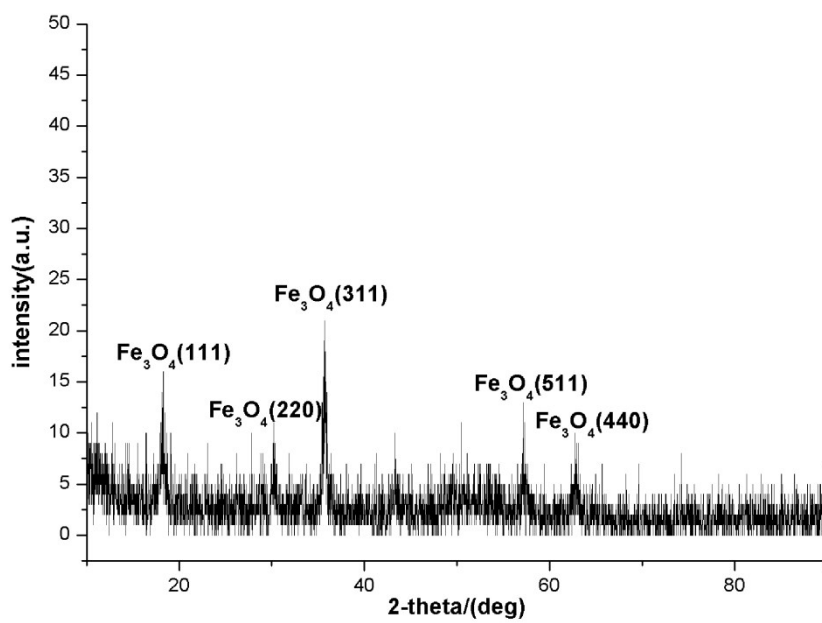


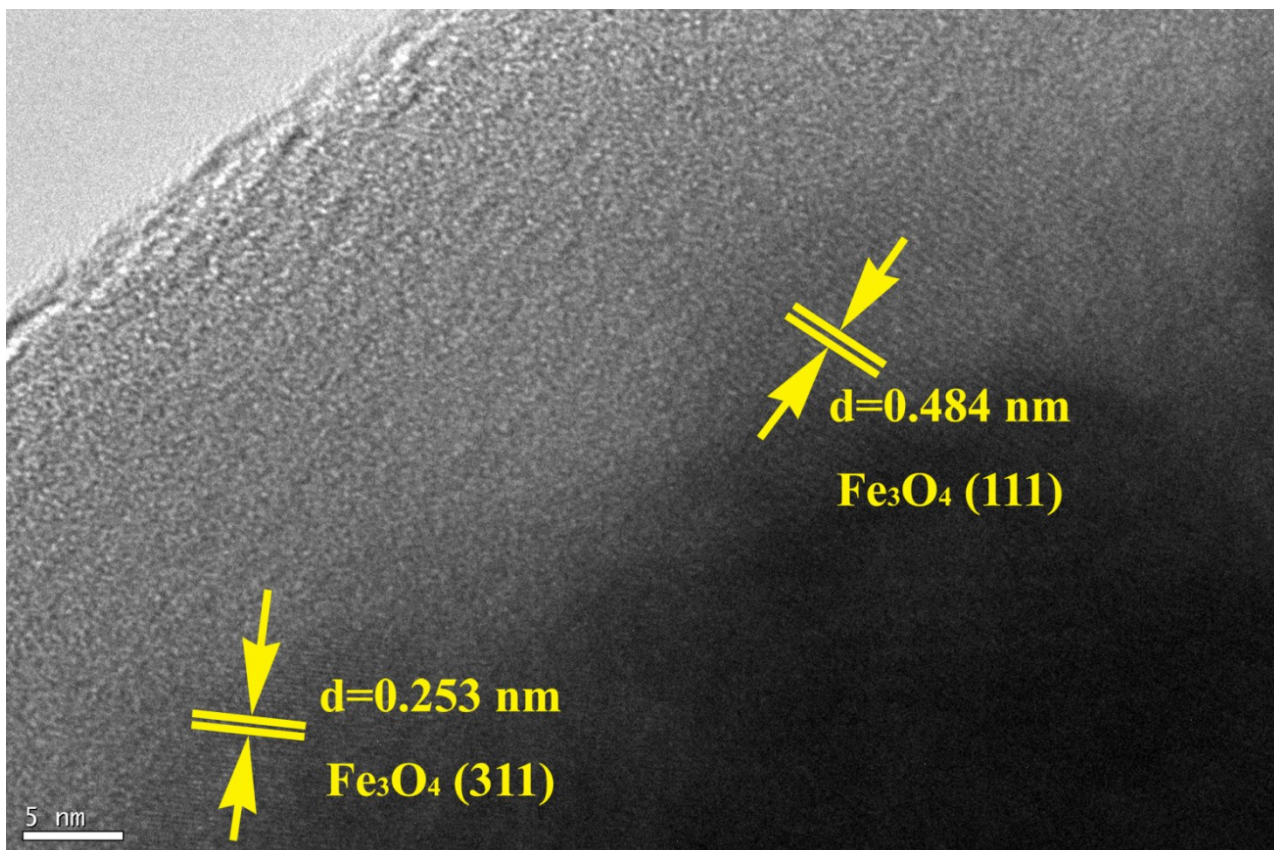
Fig. S6 Catalyst 5a



XRD of 5a

Fig. S7 XRD of 5a





HRTEM of **5a**

Fig. S8 HRTEM of **5a**

The TEM of used catalyst **5a**

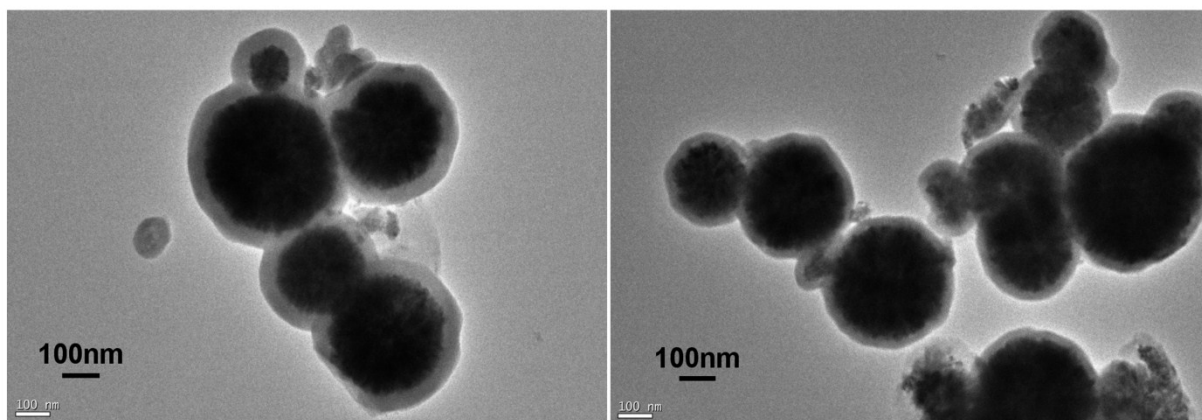


Fig. S9 TEM of used catalyst 5a