Supporting Information

# Synthesis of Brominated Alkanes via Heterogeneous Catalytic Distillation over $Al_2O_3/SO_4^{2-}/ZrO_2$

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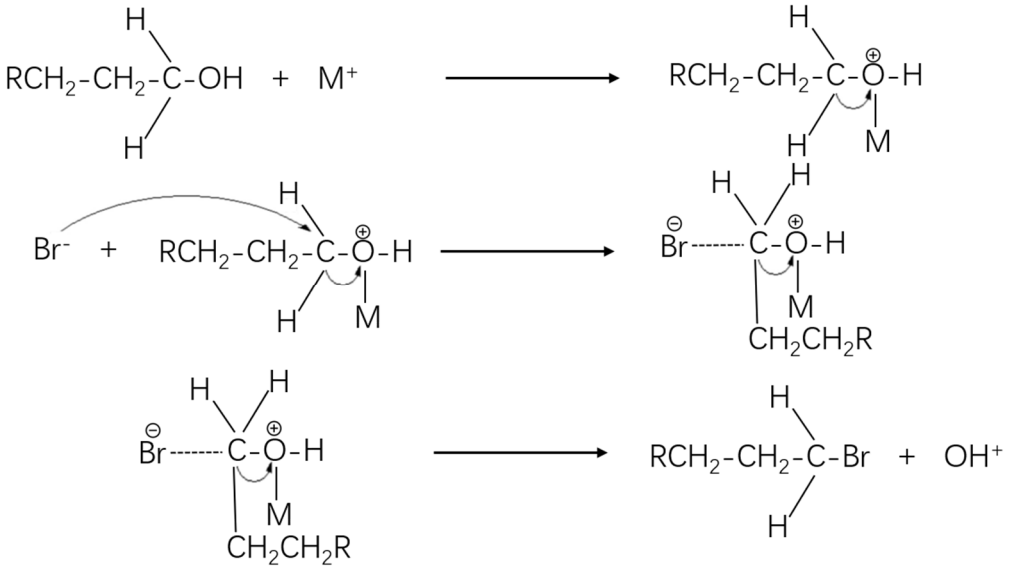


**Figure S1.** $SO_4^{2-}/M_xO_y$ catalytic reaction mechanism

**Table S1.** TOF of the $Al_2O_3/SO_4^{2-}/ZrO_2$ catalyst and comparison with other catalysts.

| Catalyst | T/°C | TOF/$h^{-1}$ | Yield/% | Ref. |
|---|---|---|---|---|
| $H_3PW_{12}O_{40}$–[bmim][$FeCl_4$] | 135 | 12.5 | 83 | [1] |
| $SO_4^{2-}/ZrO_2$-ZnO | 130 | 1.79 | 70.22 | [2] |
| methyl trioctyl ammonium chloride | 110 | 0.83 | 72.8 | [3] |
| $H_2SO_4$ | 70-130 | 4.17 | 93.2 | [4] |
| $Al_2O_3/SO_4^{2-}/ZrO_2$ | 110 | 13.33 | 96.1 | This work |

**Table S2.** Conversion substrate application of the $Al_2O_3/SO_4^{2-}/ZrO_2$ catalyst

| Substrate | T/℃ | Time/h | Yield/% |
|---|---|---|---|
| Ethanol | 90 | 3 | 93.72 |
| N-propanol | 110 | 3 | 96.18 |
| Isopropanol | 110 | 3 | 95.55 |
| N-butanol | 120 | 4 | 92.26 |

**References:**


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