Electronic Supporting Information

One-pot synthesis of Pt catalysts based on layered double hydroxides: an application in propane dehydrogenation

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Performance of Pt/Mg(Pt)(Al)Oₓ monometallic and Pt-Ga/Mg(Pt)(Ga)(Al)Oₓ bimetallic catalysts

Figure S-1: Catalytic propane dehydrogenation at 600 °C (W_{cat}/F_{propane,0} = 4 kg_{cat}·s·mol⁻¹ and P_{propane,0} = 5 kPa at a total pressure of 101.3 kPa): site-time yield (STY) vs. time on stream: (a) one-pot synthesized Pt/Mg(Pt)(Al)Oₓ and (b) one-pot synthesized Pt-Ga/Mg(Pt)(Ga)(Al)Oₓ (red = CH₄, blue = H₂, green = C₃H₆).
Stability test for Pt-In/Mg(Pt)(In)(Al)Oₓ

The stability of the one-pot synthesized Pt-In/Mg(Pt)(In)(Al)Oₓ catalyst was tested for 6 hours. Figure S-2 shows the products obtained during catalytic propane dehydrogenation at 600 °C. Notably, the partial pressure of propane was set to 20 kPa, in contrast to 5 kPa for other catalytic experiments (Figure S-1 and Figure 4). This was done to subject the catalyst to more severe reaction conditions, which could more directly uncover deactivation phenomena.

Figure S-2: Catalytic propane dehydrogenation at 600 °C (W_{cat}/F_{propane,0} = 4 kg_{cat}·s⁻¹·mol⁻¹ and P_{propane,0} = 20 kPa at a total pressure of 101.3 kPa): site-time yield (STY) vs. time on stream.