

Kinetic parameters for coke oxidation of spent Pt-Sn catalyst for propane dehydrogenation

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In propane dehydrogenation (PDH), side reaction occur on the catalyst surface leading to the coke deposited and declining activity during reaction. This study investigate the effect of H₂ ratio, various H₂ (0, 10, 20 & 30 mL/min, total feed 100 mL/ min and balancing with N₂ to Pt (3wt%)-Sn (2wt%)/ Al₂O₃ on the catalytic propane dehydrogenation, the amount of coke deposited on the surface catalyst and kinetic parameters of coke combustion modelling by thermogravimetry. We found that hydrogen ratio, H₂ has positive effect in deactivation (PDH) reaction, and hydrogen flow prevent coke on the catalyst surface and decrease the deactivation of catalyst. In different hydrogen ratio the propane conversion and propylene selectivity, was different and the highest conversion and selectivity was in 10ml/min. The coke combustion E_a of spend [3w%Pt -2w%Sn] catalyst were 116.50KJmol⁻¹ (without H₂), 191.50KJmol⁻¹ (H₂= 10ml min⁻¹), 225KJmol⁻¹ (H₂=20ml min⁻¹). As well as pre- exponential factor respectively were 8.97x10² min⁻¹ (H₂=0ml min⁻¹), 3,5x10³ min⁻¹ (H₂=10ml min⁻¹), 5,59x10⁵ (H₂=20ml min⁻¹)...