

The Different Roles between Sodium and Potassium Ions in Ion Exchange of WO₃/SiO₂ Catalysts

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Abstract : WO₃/SiO₂ catalysts were modified by an ion exchange method with sodium hydroxide or potassium hydroxide solution. The performance of the modified catalysts was tested in the metathesis of ethylene and trans-2-butene to propylene. During ion exchange, sodium and potassium ions played different roles. Sodium modified catalysts revealed constant trans-2-butene conversion and propylene selectivity when the concentrations of sodium in the solution were varied. In contrast, potassium modified catalysts showed reduction of the conversion and increase of the selectivity. From these results, potassium hydroxide may affect the transformation of tungsten oxide active species, resulting in the decrease in conversion whereas sodium hydroxide did not. Moreover, the modification of catalysts by this method improved the catalyst stability by lowering the amount of coke deposited on the catalyst surface.

Keywords : acid sites, alkali metal, isomerization, metathesis

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