

RhCo双金属催化剂的研究 I. RhCo双金属催化剂的金属-金属及金属-载体相互作用

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摘要 利用XPS对以金属盐共浸渍制备的Rh+Co/Al₂O₃和Rh₂Co₂(CO)₁₂为前体制备的Rh₂Co₂/Al₂O₃催化剂的金属-金属及金属-载体相互作用进行了详细研究。发现Rh+Co/Al₂O₃经400℃H₂还原后,Rh的结合能与Rh⁰的结合能接近,Co基本上以CoAl₂O₄状态存在,Co⁰的谱峰很弱;而Rh₂Co₂/Al₂O₃经400℃H₂还原后,Rh的结合能与Rh⁰接近,Co除CoAl₂O₄状态存在外,还有相当一部分以Co⁰状态存在。上述结果揭示出两个样品的Rh-Al₂O₃的相互作用弱,Co-Al₂O₃的相互作用强。Rh+Co/Al₂O₃上Rh-Co相互作用弱,而Rh₂Co₂/Al₂O₃在H₂还原后仍保持RhCo簇合物的强的Rh-Co相互作用,导致显著量的Co⁰存在。

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Study of RhCo bimetal catalysts I. Metal-metal and metal-support interactions on RhCo bimetal catalysts

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Abstract Metal-metal and metal-support interaction on Rh+Co/Al₂O₃ prepared by co-impregnation and Rh₂Co₂/Al₂O₃ by using RhCo carbonyl cluster as the precursor have been studied in detail by X-ray Photoelectron Spectroscopy (XPS). It was found that binding energy for Rh 3d on Rh+Co/Al₂O₃ reduced with H₂ at 400℃ is nearly identical with that of Rh⁰, and Co exists essentially in CoAl₂O₄ state and only the very small amount of Co exists as Co⁰. On Rh₂CO₂/Al₂O₃ reduced with H₂ at 400℃ Rh exists as Rh⁰, and a part of Co exists in CoAl₂O₄ state whereas another part of Co exists as Co⁰. Results above indicate that Rh-Al₂O₃ interaction for Rh+Co/Al₂O₃ and Rh₂Co₂/Al₂O₃ is weak, and Co-Al₂O₃ interaction is strong; Rh-Co interaction on Rh+Co/Al₂O₃ prepared by coimpregnation of RhCl₃ and Co(NO₃)₂ is weak, but on Rh₂CO₂/Al₂O₃ prepared by using RhCo carbonyl cluster as the precursor the strong Rh-Co interaction of RhCo carbonyl cluster is still maintained resulting in the considerable amount of Co⁰.

Key words [COBALT](#) [METAL CATALYST](#) [ALUMINIUM OXIDE](#) [CARRIERS](#) [X-RAY PHOTOELECTRON SPECTROMETRY](#) [RHODIUM](#) [INTERACTIONS](#)

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