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原位**FTIR**及探针反应法研究**Pt**与**L**沸石的相互作用

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摘要 本文报道了一种适合催化研究的金属原位IR池,Pt分散在NH~4L沸石上呈缺电子性,
在异丙醇分解反应中不显示脱氢活性,但通过加氢抗结炭作用保护着沸石上的酸位,
从而增强了NH~4L沸石的酸性催化作用,负载在碱性KL沸石上的Pt呈富电子性,在反应中极易被噻吩中毒
(Pt/KL+NH~4L)混合样品在预处理和反应的过程中Pt从KL 向NH~4L沸石上迁移,
导致其催化性能相似于Pt/NH~4L,实验证明:Pt与L 沸石载体之间存在着明显的相互作用,
由于Pt易给出电子而不易接受电子,因此与酸位的相互作用强于与碱位的相互作用.

关键词 透射电子显微术 铂 红外分光光度法 催化剂 沸石 程序升温脱附 异丙醇 相互作用 外里叶变换 探针反应法

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Investigation on interaction of Pt and zeolites using in situ FTIR and probe reactions

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Abstract A new in situ IR cell (made of metal and suitable for catalysis research) is described. The Pt dispersed on acidic NH4L zeolite exhibits "electron deficiency" and does not show obvious dehydrogenation activity in the iso-PrOH decomposition reaction. However, it enhances the conversion of iso-PrOH to form H2O and propene through the protection for acid sites on the zeolite against deactivation by carbonaceous overlayers. However, Pt on KL basic zeolite exhibits some electron rich and high dehydrogenation activity in iso-PrOH decomposition Also, Pt/KL is very sensitive to thiophene poisoning of these reactions. During pretreatment and reaction, the Pt on a mixture of (Pt/KL+NH4L) migrates from KL to NH4L resulting in catalytic properties of the mixture similar to those of Pt/NH4L in the decomposition of iso-PrOH. There is an obvious interaction between Pt and L zeolites. The supported Pt can become "electron deficient" more easily than it can become "elecronic rich" which means that the interaction of Pt with acid sites is stronger than with basic sites; this is because of the metallicity of Pt which can be an electron donor easily, but has more difficulty in being an electron acceptor.

Key words TRANSMISSION ELECTRON MICROSCOPY PLATINUM INFRARED SPECTROPHOTOMETRY CATALYST ZEOLITE TEMPERATURE PROGRAMMING DESORPTION ISOPROPANOL INTERACTIONS

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