

## V-P-O/TiO<sub>2</sub>-SiO<sub>2</sub>催化剂的制备、表征及其在丙烷氧化制取丙烯酸反应中的应用研究

程桦,韩一帆,王怀明

复旦大学化学系,上海(200433)

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**摘要** 通过湿磨法,将钒-磷-氧(V-P-O)氧化物负载于钛硅干凝胶(TiO<sub>2</sub>-SiO<sub>2</sub>)上,制备了V-P-O/TiO<sub>2</sub>-SiO<sub>2</sub>氧化物催化剂,并运用BET,XRD,TEM及XPS等技术考察了润湿剂,V-P-

O的含量及焙烧条件对催化剂结构的影响。由BET方法发现,以异丁醇为润湿剂对催化剂表面积影响较小。XRD和TEM考察结果表明,

所制备的催化剂有较高的热稳定性。通过XPS分析,证实钒元素主要以V(IV)价态存在于催化剂的表面。V-P-O/TiO<sub>2</sub>-SiO<sub>2</sub>催化剂在丙烷氧化反应中显示了良好的催化性能。

**关键词** [二氧化钛](#) [二氧化硅](#) [氧化钒](#) [氧化磷](#) [催化剂](#) [丙烷](#) [丙烯酸](#) [X射线衍射分析](#) [透射电子显微术](#) [X射线光电子谱法](#) [催化活性](#)

分类号 [0643](#)

## Preparation, characterization of V-P-O/TiO<sub>2</sub>-SiO<sub>2</sub> catalyst and its application in partial oxidation of propane

Cheng Hua,Han Yifan,Wang Huaiming

Fudan Univ, Dept Chem,Shanghai(200433)

**Abstract** Highly dispersed vanadium-phosphorus oxide (V-P-O)/titania-silica xerogel (TiO<sub>2</sub>-SiO<sub>2</sub>) were prepared by the method of wet mulling. The effects of the liquid medium, loading of V-P-O and the calcination temperature on the structure of catalysts were investigated by BET, XRD, TEM and XPS. BET shows that isobutanol as the liquid medium causes less change to the surface area of catalysts. XRD and TEM show that the prepared catalysts possess high thermal-stability up to 923K. XPS analysis shows that the vanadium on the surface can be stabilized mainly in the state of V(IV). The test oxidation of propane was also carried out with the resulting catalysts.

**Key words** [TITANIUM DIOXIDE](#) [SILICON DIOXIDE](#) [VANADIUM OXIDE](#) [PHOSPHORUS OXIDE](#) [CATALYST](#) [PROPANE](#) [ACRYLIC ACID](#) [X-RAY DIFFRACTION ANALYSIS](#) [TRANSMISSION ELECTRON MICROSCOPY](#) [X-RAY PHOTOELECTRON SPECTROMETRY](#) [CATALYTIC ACTIVITY](#)

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