

## 均匀沉淀法制备高性能催化燃烧式甲烷传感器

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摘要:

为了提高催化燃烧式甲烷传感器的性能, 以介孔SBA-15作为载体, 采用均匀沉淀法制备具有不同Pd担载量的敏感材料。通过XRD和氮气吸脱附表征材料的组成及结构, 并以该材料构筑敏感元件, 研究其气敏特性。与传统浸渍法合成的Pd/ $\gamma$ -Al<sub>2</sub>O<sub>3</sub>相比, Pd/SBA-15对于甲烷具有更加出色的敏感特性, 这主要源于其高比表面积、小而均一的Pd颗粒以及多孔结构使Pd/SBA-15上的活性位点与甲烷气体之间产生高效的界面反应。

关键词: 甲烷传感器; 介孔; 均匀沉淀法; 高灵敏度

## Highly performance methane sensors based on Pd/SBA-15 composite prepared by homogeneous deposition-precipitation method

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**Abstract:**

In order to improve the sensitive properties of catalytic combustion type methane sensor, the sensing material with different amounts of Pd were synthesized by homogeneous deposition-precipitation (HDP) method via using mesoporous SBA-15 as supports. The mesoporous structure and composition of Pd/SBA-15 were characterized by powder X-ray diffraction (XRD) and nitrogen adsorption/desorption. The sensors based on Pd/SBA-15 exhibit much higher sensitivities to methane, compared to those using conventional Pd/ $\gamma$ -Al<sub>2</sub>O<sub>3</sub>. It is believed that the excellent gas sensing properties of them were derived from their high surface area, small and uniform Pd particle size, and spongy structure, which lead to highly effective surface reaction between target gas and surface active sites in Pd/SBA-15.

**Keywords:** methane sensor; mesoporous; HDP method; high sensitivity

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