

论文

## 磁性碳化硅陶瓷先驱体聚铁碳硅烷的研究

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**摘要** 通过低分子量的聚硅烷与二茂铁反应合成了聚铁碳硅烷(PFCS). 探索了反应温度、裂解温度、二茂铁含量等因素对合成PFCS的影响. 元素分析、红外光谱、氢谱分析表明, 铁被引入到PFCS中, PFCS与聚碳硅烷的结构相似. 高温裂解聚铁碳硅烷所得碳化硅陶瓷具有一定的磁性.

**关键词** [聚铁碳硅烷](#) [裂解温度](#) [二茂铁](#) [碳化硅](#) [磁性](#)

分类号

## STUDY ON POLYFERROCARBOSILANE AS PRECURSOR OF MAGNETIC SILICON CARBIDE CERAMIC

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**Abstract** A polyferrocarnosilane(PFCS) was synthesized from low molecular weight polysilane and ferrocene. The synthesis techniques including reaction temperature, pyrolysis temperature and ferrocene content were investigated. The molecular weight and soft point of PFCS increase with raising reaction temperature, pyrolysis temperature, and adding more ferrocene. The most suitable synthesis conditions for PFCS are as follows, reaction temperature 350-420°C. pyrolysis temperature 450~510°C. The reaction temperature and pyrolysis temperature decrease greatly because of adding ferrocene. PFCS was characterized by element analysis, FT-IR and <sup>1</sup>H-NMR. As a result, element iron was introduced to the polymer, and it seemed that the structure of PFCS is similar to that of polycarbosilane (PCS). The silicon carbide ceramic obtained from PFCS shows some magnetic properties.

**Key words** [Polyferrocarnosilane](#) [Pyrolysis temperature](#) [Ferrocene](#) [Silicon carbide](#) [Magnetic properties](#)

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