

### 论文摘要

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## 铁基合金粉末氧化行为

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**摘要:** 采用质量变化、氧含量测定、XRD、SEM和能谱分析研究铁基合金粉末500 °C氧化行为及氧化机理。结果表明, 氧化质量增量、氧含量随时间变化明显, 前期呈线性关系, 后期则呈抛物线关系; 前期由于氧化时间较短, 铁基合金粉末颗粒与氧反应不明显, 后期氧与颗粒表面反应, 生成Fe、Cr和Ti的氧化物, 并形成致密的氧化膜; 铁基粉末形成(Fe, Cr)<sub>2</sub>O<sub>3</sub>相, 随着氧化时间的延长, 形成的(Fe, Cr)<sub>2</sub>O<sub>3</sub>相衍射峰强度增强。

**关键字:** 铁基粉末; 氧化行为; 氧化机理

## High temperature oxidation behavior of iron-based metal powder

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**Abstract:** The oxidation behavior of an iron-based metal powder at 500 °C was investigated by mass gain and oxygen content measurements, X-ray diffraction, scanning electron microscope and energy spectrum analysis. The results show that the change of mass gain and oxygen content increase obviously with the time increasing; their relationship is linear at the former stage and parabolic at the later stage. The reaction between iron-based powder and oxygen at the initial stage was very slow. After a certain period, oxygen clearly reacted with the surface of the particles, and the formed oxide scale became thick and compact, which consisted of oxides of Fe, Ti and Cr, (Fe, Cr)<sub>2</sub>O<sub>3</sub> was detected by XRD, the intensity of its diffraction peaks became stronger with time.

**Key words:** iron-based powder; oxidation behavior; oxidation mechanism

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