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3种二组元粉体的混合特征

欧阳鸿武, 何世文, 廖奇音, 韦嘉

(中南大学 粉末冶金国家重点实验室, 长沙 410083)

摘要: 为了探明粉末物性差异对混合过程效果的影响, 将形状不规则的Ti粉、近球形的 Al_2O_3 粉和Al粉分别与Fe粉按相同比例构成3种二元粉末体系, 并通过实验测定了这3种粉末体系在圆筒型混合器中混合过程均匀度的变化, 并对混合过程进行了理论分析。结果表明: 粉末物性的差别对混合过程产生明显的影响, 在相同填充率和转速下, 经过50s的混合, 流动性较好的 Al_2O_3 粉、Al粉与Fe粉的混合均匀度分别达到0.048和0.025, 扩散系数分别为0.293和0.375; 而流动性较差的Ti粉与Fe粉却未得到有效的混合, 混合均匀度只达到0.275, 扩散系数为0.064。

关键词: 圆筒型混合器; 混合; 颗粒; 粉体

Mixing characteristics of three kinds of two-component powders in rotating drum blender

OUYANG Hong-wu, HE Shi-wen, LIAO Qi-yin, WEI Jia

(State Key Laboratory of Powder Metallurgy,
Central South University, Changsha 410083, China)

Abstract: In order to explore the effect of mixing features between different powders, the experimental and theoretic research of mixing of three groups two-component powder, irregular Ti powder, spherical Al_2O_3 powder with rough surface and spherical Al powder with smooth surface to mix with nodular Fe respectively on same mass percentage, were carried out with a rotating drum blender. The results show that the characteristics of powder have great influence on efficiency of mixing and diffusion process, the more similar the physical characteristics of the mixing powder, the better the mixing performance. The Fe- Al_2O_3 and Fe-Al are mixed well in 50s, but Fe-Ti is not, the standard deviation of Fe- Al_2O_3 , Fe-Al and Fe-Ti are 0.048, 0.025 and 0.275, the diffusion efficient 0.293, 0.375 and 0.064, respectively.

Key words: rotating drum blender; mixing; granular; powder

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地址: 湖南省长沙市岳麓山中南大学内 邮编: 410083

电话: 0731-8876765, 8877197, 8830410 传真: 0731-8877197

电子邮箱: f-ysxb@mail.csu.edu.cn