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论文

宽粒级煤浮选机流场数值模拟研究

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摘要：

将流态化机理与宽粒级煤浮选过程相结合，在一个浮选设备中实现细粒常规浮选与粗粒流态化浮选所需的不同流体力学环境，自行设计了一种新型宽粒级煤浮选机，并采用FLUENT 6.3.26软件进行数值模拟研究，从速度和湍流度两个方面对浮选机内流场进行分析。结果表明：在浮选机内增加格栅板后，可将浮选机内流场分为低速、弱湍流和高速、强湍流两个区域，从而可为粗、细颗粒浮选创造各自所需的流体力学条件；通过对叶轮圆周线速度比值与合速度比值和湍流强度比值变化规律的分析，找出浮选机模拟放大的运动相似准则。

关键词： 宽粒级煤；浮选；流场；数值模拟

A numerical simulation study on the flow field of wide size fraction coal flotation machine

Abstract:

A pioneering wide size fraction coal flotation machine was designed to create different liquid environments for fine grained conventional coal flotation and coarse grain of fluidized flotation in the same flotation machine，through combining the fluidized mechanism with wide size fraction coal flotation.Fluent 6.3.26 software was used for the numerical simulation，and the flow field in the flotation machine was analyzed in terms of the velocity and turbulent intensity.The results show that the fluid mechanical conditions for fine and coarse coal flotation can be created in the same machine by dividing the inner fluid field into two areas after adding the grille board：low speed，weak turbulence and high speed，strong turbulence.The motion similarity criteria of imitating and enlarging the flotation machine are determined through the variation analysis of impeller circumference line speed ratio to resultant velocity ratio and turbulence intensity ratio.

Keywords: wide size fraction coal；flotation；flow field；numerical simulation

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