

论文

搅拌磨机捕获粉碎机理的理论与实验研究

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摘要:

从搅拌磨介质运动规律和颗粒的受力分析入手, 研究超细搅拌磨矿的捕获粉碎和冲击粉碎机理, 推导出捕获角、摩擦角与捕获颗粒的关系式, 提出介质直径与磨矿颗粒直径之比——捕获粒度比的概念。通过理论分析和试验验证得出: 在机械参数一定的条件下, 搅拌磨矿能耗与磨矿时间成正比; 捕获角等于摩擦角时, 捕获角、捕获粒度和捕获体积最大, 磨矿效率最高, 能耗最低; 随磨矿时间的增加, 捕获角、粒度比和捕获体积减小, 磨矿效率降低; 当捕获角、粒度比和捕获体积足够小时, 增加磨矿时间, 粒度比不再变化, 且粒度比存在极限值。据此, 提出最大捕获角和极限粒度比的介质选取原则。

关键词: 搅拌磨机; 捕获角; 捕获粒度; 介质直径

Theory and experimental study on the mechanism of particles capture for ultra fine stirred mill

Abstract:

As per the force analysis on the medium movement of stirred mill and stress on the particles, the mechanism of capture crushing and impact crushing for ultrafine stirred mill was studied to deduce the relational expression among capture angle, friction angle and capture particles as well as raise the ratio of medium diameter to stirred mill particles: size ratio. According to the theoretical analysis and experimental verification, we can conclude that the energy consumption of stirred mill is proportional to the grinding time. When the capture angle is equal to the friction angle, the capture angle, capture granularity and capture size are the largest, the grinding efficiency is the highest and the energy consumption is the lowest. With the increase of grinding time, the capture angle, size ratio and capture size decreases and the grinding efficiency reduces. As the capture angle, size ratio and capture size are small enough, the size ratio will not change though the grinding time is extended, so as to arrive at the limit value of size ratio. Thus, authors bring forward the medium selection principle for the largest capture angle and terminal size ratio.

Keywords: stirred mill; capture angle; capture size; medium diameter

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