

论文

煤矸破碎粒度分布规律的分形特征试验研究

郑克洪, 杜长龙, 邱冰静

中国矿业大学 机电工程学院, 江苏 徐州 221008

摘要:

为寻找煤矸破碎粒度的分布规律, 根据分形理论建立了煤矸破碎粒度分布的分形表达式, 并与威布尔分布比较, 寻找煤矸破碎特性指数、破碎程度参数、分形维数与各影响参数的关系。首先对不同杆数的滚筒进行煤矸破碎试验, 根据实验结果选择合适的杆数, 并对参数间的关系进行探讨; 其次, 对不同杆形的滚筒进行煤矸破碎实验, 根据实验结果确定杆形对煤矸破碎粒度分布的影响; 最后对不同地质条件下的煤矸进行破碎实验, 研究不同硬度的煤矸对煤矸破碎粒度分布的影响。研究表明: 杆数为6、杆形为三角杆的滚筒破碎效果最好。威布尔分布、分形分布均可表示煤矸破碎粒度的分布规律, 但用分形分布表示煤矸破碎粒度的分布规律, 能更好地表达煤矸破碎粒度的分布规律, 可以更好地指导生产。

关键词: 煤; 矸石; 滚筒; 粒度分布; 分形维数; 威布尔分布

Experimental study on the fractal characteristics of crushing coal and gangue

Abstract:

To calculate the distribution of particle size of crushing coal and gangue, a mathematical model was built according to fractal theory. In addition, a comparison was made between Weibull distribution and fractal distribution, in order to ascertain the relationships between influence parameters and the coal fragmentation characteristic index, the coal fragmentation degree parameter and the fractal dimension. The test was divided into three parts: Firstly, the test was performed under different stem form and number of stems, the appropriate number of which is chosen based on experiment results, and the relationship between the parameters were discussed. Secondly, the test was performed for different stem forms of the cylindrical roll, in order to find the relationship between different stem forms and the size distribution of coal and gangue. Finally, the influence of the different geological conditions on the size distribution of crushing coal and gangue was studied under the cylindrical roll. The study results show that the two types of distribution functions are all suitable for coal lump size distribution, while the coal fragmentation fractal dimension can be expressed using the fractal dimension in the fractal distribution, which can better describe the size distribution of coal and gangue.

Keywords: coal; gangue; cylinder; particle size distribution; fractal dimension; Weibull distribution

收稿日期 2012-04-28 修回日期 2012-06-22 网络版发布日期 2013-07-01

DOI:

基金项目:

江苏省高校科研成果产业化推进资助项目 (JHB2011-31)

通讯作者: 郑克洪

作者简介: 郑克洪 (1986—), 男, 江苏徐州人, 硕士研究生

作者Email: 474008900@qq.com

参考文献:

本刊中的类似文章

扩展功能

本文信息

- ▶ Supporting info
- ▶ PDF (1860KB)
- ▶ [HTML全文]
- ▶ 参考文献PDF
- ▶ 参考文献

服务与反馈

- ▶ 把本文推荐给朋友
- ▶ 加入我的书架
- ▶ 加入引用管理器
- ▶ 引用本文
- ▶ Email Alert
- ▶ 文章反馈
- ▶ 浏览反馈信息

本文关键词相关文章

- ▶ 煤; 矸石; 滚筒; 粒度分布; 分形维数; 威布尔分布

本文作者相关文章

- ▶ 郑克洪
- ▶ 杜长龙
- ▶ 邱冰静

PubMed

- ▶ Article by Zheng, K.H
- ▶ Article by Du, Z.L
- ▶ Article by Qiu, B.J