岩矿测试
ROCK AND MINERAL ANALYSIS
中文核心期刊

文章摘要

路新成,曹景洋.HELOS/BF型激光粒度仪湿法测试条件的优化[J].岩矿测试,2013,32(4):590~594

HELOS/BF型激光粒度仪湿法测试条件的优化

SUCELL Test Conditions Optimization of HELOS/BF Laser Particle Size Analyzer

投稿时间： 2012-10-20 最后修改时间： 2012-11-21

DOI：

中文关键词： 激光粒度仪 粒度分布 测试条件

英文关键词：laser particle size analyzer particle size distribution testing conditions

基金项目：国土资源公益性行业科研专项(201111028)

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中文摘要：

激光粒度仪以测试速度快、操作方便、重复性好等优点得到越来越广泛的应用,但仪器技术参数和测试条件不同对样品粒度测试结果有着显著影响。本文通过实验得到了HELOS/BF型激光粒度仪的优化测试条件,结果表明:对于比重小或粒径小的样品,采用低搅拌速率、高超声强度和较长超声时间;对于粒径大或比重大的样品,应采用高搅拌速率、低超声强度和较短超声时间。分散剂能加快样品颗粒的分散,且对于粒径小的样品分散效果更好。测试时进样浓度(遮光度)过低,样品中的颗粒数过少,检测不到足够的信号,使样品不具有代表性,样品粒径测定结果偏高;进样浓度过高,出现多重散射而使粒度分布范围较宽,样品粒径测定结果偏低。研究认为,HELOS/BF型激光粒度仪的合适进样浓度为10%~25%。

英文摘要：

The Laser Particle Size Analyzer is being more widely used due to its fast test speed, convenient operation and good repeatability, to name a few of its qualities. However technical parameters of instrument and test conditions affect the results significantly. The test conditions of the HELOS/BF Laser Particle Size Analyzer were optimized by experiments described in this paper. The results indicate that samples with light specific-gravity or small particle size require lower stirring speed, higher ultrasonic intensity and longer ultrasonic time. Samples with heavy specific-gravity or large particle size require higher stirring speed, lower ultrasonic intensity and shorter ultrasonic time. The dispersant can accelerate the dispersion of the sample particles, especially for the small particle size samples. The low injection concentration (shading rate) with less particles leads to higher measured results for particle size because the weak signal causes bad representation for the samples. The high injection concentration leads to lower measured results based on the broad range of particle size distribution by multiple scattering. It suggests that the injection sample concentration (shading rate) between 10%-25% was appropriate for the HELOS/BF Laser Particle Size Analyzer.

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