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文章摘要

唐梦奇, 刘顺琼, 袁焕明, 谢毓群, 刘国文, 罗明贵. 粉末压片制样-波长色散X射线荧光光谱法测定进口铜矿石中的氟[J]. 岩矿测试, 2013, 32(2): 254~257

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Determination of Fluorine in Import Copper Ores by Wavelength Dispersive X-ray Fluorescence Spectrometry with Pressed Powder Preparation

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中文摘要:

地质样品中氟的测定主要采用氟离子选择电极法, 但操作复杂、分析时间长, 无法满足大量进口铜矿石检测的需求。熔融制样-X射线荧光光谱法可用于测定铜矿石中的主含量成分, 但不能测定氟。本文采用粉末压片制样, 波长色散X射线荧光光谱测定进口铜矿石中氟的含量。以15个粒度为0.074 mm的实际进口铜矿石样品建立标准曲线, 经验系数法校正基体效应, 有效地降低了颗粒度效应、矿物效应和基体效应。方法的精密密度为0.30%(RSD, $n=11$), 检出限为2.4 $\mu\text{g/g}$, 测定范围为0.030%~0.20%。用标准物质验证, 测定结果与标准物质的认定值相符; 用实际样品验证, 测定结果与氟离子选择电极法的测定值相符, 能满足进口铜矿石中氟(限量不大于0.10%)日常分析检验的要求。

英文摘要:

Fluorine content in geological sample ore is often detected by Fluorine Ion Selective Electrode. This method does not meet the demands of analysing large amounts of imported copper ores, due to it being a complicated procedure with a lengthy analysis period. Major and minor

components in copper ores have been detected by X-ray Fluorescence Spectrometry using the fusion method for sample preparation, but this method cannot detect fluorine content. In this paper, the method for detecting fluorine content in imported copper ores is presented by using Wavelength Dispersive X-ray Fluorescence Spectrometry with pressed powder preparation. A calibration curve was established by using fifteen practical imported copper ore samples whose granularity was 0.074 mm. The application of the empirical coefficient method significantly reduced the particle and mineral effect, and the matrix effect. The relative standard deviation (RSD, $n=11$) of fluorine determined in imported copper ores was 0.30%. The detection limit of the method was 2.4 $\mu\text{g/g}$ and the measuring range was from 0.030 % to 0.20%. The method has been applied to the determination of fluorine in standard materials and practical samples, and the analytical results were in good agreement with certified values of standard materials and values of practical samples determined by Fluorine Ion Selective Electrode. This method meets the routine inspection needs of fluorine content in imported copper ores, which is less than 0.10%.

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