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承德钒钛磁铁矿钒和钛物相的联测分析方法

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Determination Method of Vanadium and Titanium Phases for Chengde Vanadium Titanium Magnetite

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中文摘要:

依据承德地区大庙式钒钛磁铁矿床特征, 通过人工重砂分离及单矿物化学分析并结合电子探针、岩矿鉴定结果查明了承德钒钛磁铁矿石中的含钒矿物主要是钛磁铁矿和磁铁矿, 次要矿物是钛铁矿和硅酸盐; 含钛矿物主要是钛铁矿、钛磁铁矿, 次要矿物是金红石、榍石。根据承德钒钛磁铁矿石钒和铁呈正比的关系, 选取代表性试样进行了钒钛物相分析项目的确定及溶剂选择的实验, 最终确定了钒和钛物相分析测定流程。钒物相分析测定项目为磁铁矿和钛磁铁矿中的钒、钛铁矿中的钒、硅酸盐中的钒及总钒四项; 钛物相分析测定项目为钛铁矿中的钛、磁铁矿和钛磁铁矿中的钛、金红石中的钛、硅酸盐中的钛及总钛五项。通过本方法测定的各种含钒和钛矿物含量占矿石中总钒和总钛含量的比例与人工重砂分析定量计算的各种含钒和钛矿物含量占矿石中总钒和总钛含量的比例是相互吻合的。对110件钒钛磁铁矿石样品进行了4种含钛矿物及3种含钒矿物物相分析, 结果与实际地质成矿组分符合。本方法实现了钒钛磁铁矿中钒矿物和钛矿物的定量分离, 确定了钒和钛物相联测分析流程, 可以同时测定钒和钛矿物的含量。

英文摘要:

According to characteristics of the Damiao type vanadic-titanomagnetite deposit in the Chengde area, the mineral compositions of the deposit were studied by using artificial heavy sands separation, single mineral chemical analysis, electron probe and mineral and rock identification. The results indicate that major V-bearing minerals of the Chengde vanadium-titanium magnetite ores are Titanium magnetite and magnetite and the minor minerals are ilmenite and silicate. The major Ti-bearing minerals are ilmenite and Titanium magnetite with the minor Ti-bearing minerals being rutile and sphene. According to the positive relationship of V and Ti in the Chengde vanadium-titanium magnetite ore, a representative sample was selected for V and Ti phase project identification analysis and solvent selection experiments to determine the final phase analysis procedure of V and Ti. Four V Phase analysis projects were used to determine V in magnetite, Titanium magnetite, ilmenite and silicates with total V content. Five Ti phase analysis projects were used to determine Ti in ilmenite, magnetitie, titanium magnetite, rutile and silicates with total Ti content. The proportions of the contents of V and Ti bearing minerals over the total V and Ti contents by this method were consistent with those determined by artificial heavy sand separation. 4 kinds of Ti-bearing minerals and 3 kinds of V-bearing minerals were selected for phase analysis of 110 pieces of vanadium-titanium magnetite ore samples. The results were in accord with the mineral compositions of the actual geological samples. The established method was good for V and Ti minerals quantitative separation in vanadium-titanium magnetite ore. The established joint procedure for V and Ti phase analysis was good for the simultaneous determination of contents of the V and Ti bearing minerals.

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