

CHARACTERIZATION BY WDX ANALYSIS OF A NEW MINERAL FROM WEEKSITE GROUP.

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Weeksite group is constituted by tectosilicates of U-Th with structural formula of $K_{1,6}Ba_{0,25}Ca_{0,12}[(UO_2)_2(Si_5O_{13})]H_2O$ [1]. Chemical variations are relatively frequent, such as barium and/or thorium enrichment in substitution of potassium. However, this substitution is hard to evaluate since the barium, calcium and thorium quantities sometimes can be less than 1 percent; reason why EDX and WDX microanalysis are a choice for Chemical characterization this mineral, since it is also very difficult to find large specimens for bulk analysis by other techniques. The weeksite from Urucum, M.G., Brazil was chemically characterized by EDX/WDX spectrometers (Oxford Isis 300 and 600i Microspec, respectively) coupled to a scanning electron microscopy (Leo S440).

Studies by SEM/EDX on a thin-polished section of microcrystalline weeksite show that potassium and thorium are present, however, their energy peaks are close enough to not allow a proper quantitative analysis by an EDX spectrometer. WDX spectrometer would easily discriminate thorium and potassium energy peaks. But, some WDX's conditions must be adjusted in order to properly discriminate the potassium peaks from the thorium ones. The lower energy K background was properly set in order to minimize the peak overlap with thorium and uranium. Oxygen, silicon, strontium, phosphorus, uranium, calcium and barium also were analyzed in 12 kV and 50 nA conditions. The final analysis shows that the weeksite has 47.2% of UO_3 , 26.3% of SiO_2 , 10.9% of ThO_2 , 2.28% of BaO , 0.61% of K_2O , 0.59% of P_2O_5 and 0.16% of CaO . It was not possible to carry out a proper evaluation of the OH amount; its content was related to the difference between the sum of analyzed compounds by EDX/WDX to a 100%.

Key Words

Weeksite, WDS, EDX, chemical analysis