

Raman Spectra and Luminescence of the Minerals with Aeschnite and Euxenite Crystal Structure

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Metamict minerals aeschnite-(Y) and polycrase-(Y) showed aeschnite and euxenite structure after recrystallization, respectively. Raman spectra of these minerals show luminescence lines strongly interfering with normal vibration modes (Fig. 1), especially in 200-500 cm^{-1} range (region of Ti/Nb/Ta-O stretching and bending modes). However, their synthetic analogs of REETiTaO₆ composition having single REE content and aeschnite or euxenite structure do not show luminescence lines using 488 and 514.5 nm Ar excitation lines up to 900 cm^{-1} with exception of the Er member [1]. In the case of polycrase-(Y) a separated strong luminescence line is also observed at 684 cm^{-1} . The origin of luminescence in these minerals is discussed in term of the complex REE composition, the crystal field formed in the structure during recrystallization process and its influence on REE in cation sites.

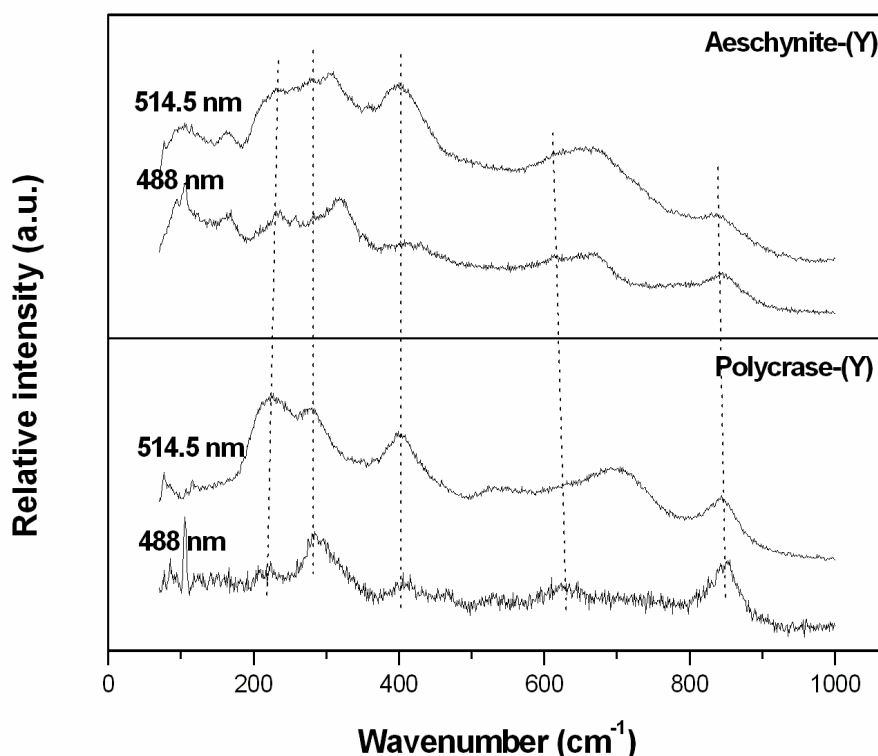


Fig. 1: Raman spectra of aeschnite-(Y) and polycrase-(Y) excited by 488 and 514.5 nm Ar line. Dashed lines indicate the position of Raman modes common for aeschnite and euxenite structure.

[1] C.W.A. Paschoal, R.L. Moreira, C. Fantini, M.A. Pimenta, K.P. Surendran, M.T. Sebastian, J. Eur. Ceram. Soc. 23 (2003) 2661.