Heteronuclear Eu:Cu trichloroacetate and its polynuclear Eu analogue; thier spectroscopy and magnetism.

Autorzy

Janina Legendziewicz

Małgorzata Borzechowska

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Single crystals of europium trichloroacetates of formulae $Eu(CCl_3COO)_3{\cdot}2H_2O$ (**1**) and $CuEu_2(CCl_3COO)_8{\cdot}6H_2O$ (**2**) were obtained. They are isomorphic with the respective Er and (Nd:Cu) compounds. Absorption, excitation, emission as well as magnetic susceptibility measurements in the 1.7–300 K range were carried out. The spectroscopic and magnetic data were analysed. The absorption spectra of compounds **1** and **2** at room and low temperature were compared and the differences in the splitting of the levels described as a result of the CF effect and the effect of the d-electron ion. The emission of Eu^{3+} was completely quenched in the heteronuclear single crystal (**2**) at 293 and 77 K. The oscillator strengths of the f–f transitions were calculated and the radiative processes analysed. Weak vibronic components recorded in the low-temperature excitation and emission spectra were promoted by localised M–L and internal ligand modes. The number of Stark components of the L′S′J′ levels in both systems (**1** and **2**) was analysed and the symmetries of the metal centres determined and compared with the results of X-ray analysis. The value of the splitting of the first excited state, $^7F_1$, was used to explain the LT and HT magnetic properties of the systems under investigation. The role of the heteroatom was considered and related to the data of earlier reported respective systems.

Słowa kluczowe

Heteronuclear Eu:Cu trichloroacetate, Europium trichloroacetate, Absorption spectroscopy, Luminescence, Magnetism

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