



Optical spectroscopy of europium nitrate with 2,2'-bipyridine $\text{Eu}(\text{NO}_3)_3 \cdot \text{Bpy}_3$. One more of compounds with outer-sphere Bpy molecule ?

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The complex compound $\text{Eu}(\text{NO}_3)_3 \cdot \text{Bpy}_3$ (Bpy, 2,2'-bipyridine) was synthesised and analysed by methods of optical spectroscopy. The spectra and details of the structure were discussed and compared with ones of well-known compounds $\text{Eu}(\text{NO}_3)_3 \cdot \text{Bpy}_2$ and $\text{Eu}(\text{NO}_3)_3 \cdot \text{Phen}_2$ (Phen, 1,10-phenanthroline). The water admixed to the ethanol as solvent promotes Bpy building into the outer sphere of complex $[\text{Eu}(\text{NO}_3)_3 \cdot \text{Bpy}_2] \cdot \text{Bpy}$. Both kinds of Bpy molecules in $\text{Eu}(\text{NO}_3)_3 \cdot \text{Bpy}_3$ compound are nearer to coplanar, than Bpy in $\text{Eu}(\text{NO}_3)_3 \cdot \text{Bpy}_2$. The bonds Eu–N are stronger and the bonds Eu–O are weaker in $\text{Eu}(\text{NO}_3)_3 \cdot \text{Bpy}_3$ in comparison with the ones in $\text{Eu}(\text{NO}_3)_3 \cdot \text{Bpy}_2$. The outer-sphere Bpy molecule, effecting as a “steric” factor, changes the nearest surroundings of Eu^{3+} ion in $[\text{Eu}(\text{NO}_3)_3 \cdot \text{Bpy}_2] \cdot \text{Bpy}$, making it similar to one of $\text{Eu}(\text{NO}_3)_3 \cdot \text{Phen}_2$.

Słowa kluczowe

Europium nitrates, Raman spectra, IR spectra, Luminescence spectra, Luminescence excitation spectra

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