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Complexes of divalent europium with dotp and dotpph.

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Streszczenie

Two complexes of divalent europium, with 1,4,7,10-tetraazacyclododecane-1,4,7,10-tetrakis(methylene phosphonate) (dotp) and 1,4,7,10-tetraazacyclododecane-1,4,7,10-tetrakis(methylene *P*-phenylphosphinate) (dotpph), were obtained by electrochemical synthesis. In both compounds, the Eu^{2+} cation is 8-coordinate, surrounded by 4 oxygen atoms from phosphonate or phosphinate groups and 4 nitrogen atoms. The complex with dotp shows green luminescence at 77 K, while in the dotpph complex the emission is almost completely quenched. The TD DFT calculations suggest that in both complexes the emission is of anomalous character: s → f for the first complex and π* → f for the other. Polarographic half-wave potentials of both complexes are similar to those of Eu aminopolycarboxylates. The Eu–O bonds, analyzed using topological methods, are found to be ionic; the Eu–N bonds in the first complex show a certain degree of covalency, while in the other one they are ionic.

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