Crystal structures and spectroscopy studies of lanthanide complexes with l-proline $[Ln(l\text{-}proH)_2(H_2O)_5]Cl_3$ (Ln = Ho, Dy)

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Abstract: The isomorphic crystals of dysprosium(III) and holmium(III) complexes with proline of formula $[Ln(C_5H_9NO_2)_2(H_2O)_5]Cl_3$ (compound I holmium; compound II, dysprosium) were synthesized and characterized by crystal structures and spectroscopic properties. The space group is $P2_1$ with lattice parameters: I a = 11.968(2), b = 11.030(2), c = 8.309(2) ??, ? = 106.97(3)?; II a = 11.968(4), b = 11.038(4), c = 8.302(2) ??, ? = 107.00(3)?. The structures of the title compounds differ significantly from that of $[Nd(proH)_3(H_2O)_2](ClO_4)_3$, with different bonding modes for the proline ligands. The holmium and dysprosium structure contains one-dimensional polymers with the chains lying along the y-axis. Absorption spectra of the holmium monocrystal were measured along the a-axis at room temperature. Intensities of f-f transitions were analysed on the basis of Judd theory. The influence of the bonding mode of the carboxyl group on the intensity of the $^5I_8$?? $^5G_6$ hypersensitive transition of the Ho^{3+} ion was considered and confronted for all spectroscopy data available for holmium carboxylate monocrystals. ?? 1989.

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