Synthesis, stability and zeolitic behavior of δALn3F10,xH2O and γThLn2F10,H2O phases (Ln = lanthanide)

Titre	Synthesis, stability and zeolitic behavior of δALn3F10,xH2O and γThLn2F10,H2O phases (Ln = lanthanide)
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Résumé en anglais	Two series of hydrated fluorides have been prepared by a “chimie douce” process. For the first family, more than twenty five compounds of δ-ALn_3F_{10},xH_2O (A^+ = alkaline ions, NH_4^+, H_3O^+ and Ln = lanthanide) have been prepared. They crystallize in the *Fd [[3 with combining macron]] m* space group (a ≈ 15.4 Å and *Z* = 16) and are isotypic with δ-$(H_3O)Yb_3F_{10}$,xH_2O (*x* = 1). The diamond-type structure of these phases (diamond stacking of octahedral units of antiprisms, called $UOA_{[8]}$), creates cavities and tunnels where the water molecules can move. The second family, γ-$ThLn_2F_{10}$,H_2O (Ln^{3+} = Er^{3+}, Dy^{3+} and Yb^{3+}) results from the substitution of Ln^{3+} and A^+ by a tetravalent cation. The new compound γ-$ThEr_2F_{10}$,H_2O (*Fm [[3 with combining macron]] m* space group, a = 10.739(1) Å and Z = 8) is isotypic with γ-KYb_3F_{10}. Water molecules are located inside the tunnels (8c sites) of a CCP stacking of $UOA_{[8]}$ through which they can move. For both series, the thermal stability and the zeolitic behaviour, studied by DTA/TGA and X-ray thermodiffractometry, are reported and a low zeolitic water capacity, around 2–4% in mass, is observed.
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