## Synthesis and Thermal Behaviour of new Lanthanide Oxalatosquarates

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During the course of our synthetic efforts on metal carboxylates with open architectures employing mixed dicarboxylates to obtain potential properties as porosity, cation-exchange as well as non-linear optical characteristics [1], a series of hydrated lanthanide compounds was produced by hydrothermal reactions. Results of the first X-ray single crystal structure analysis indicate the formation of a new low water content lanthanum oxalato-squarate, La<sub>2</sub>(C<sub>2</sub>O<sub>4</sub>)<sub>2</sub>(C<sub>4</sub>O<sub>4</sub>).2H<sub>2</sub>O, whose structure features a novel dense 3D network. It crystallizes with orthorhombic symmetry, a = 7.7326(1), b = 18.2553(2) and c =18.3299(2) Å, S.G. *Cmca* and Z = 8. The structure is built from edgesharing LaO<sub>9</sub> tricapped trigonal prims resulting in chains running along [100]. The rôles of the  $C_2O_4^{2-}$  anions is to enforce the connection within a chain acting as bridging monodentate groups and to link the chains together according to a bidentate mode. A tunnel framework along [100] results, showing strongly bonded water molecules inside the smallest pores while planar tetra-monodentate squarate groups fill the widest voids bridging four LaO<sub>9</sub> polyhedra.

Additionally, in order to determine if the new materials exhibit any particular thermal behaviour, the decomposition mechanisms into nanocristalline  $Ln_2O_3$  oxides, through the loss of water molecules and the departure of gases such as CO, CO<sub>2</sub>, were investigated by using complementary methods, TDXD and simultaneous TG-MS coupling techniques.

[1] Vaidhyanathan R., Natarajan S., Rao C.N.R., J. Solid State Chem., 2004, 177, 1444.

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