

**m41.p13****Structural filiations in the new SrLiMTi<sub>4</sub>O<sub>11</sub> (M = Cr, Fe) titanates**P. Graverneau<sup>a</sup>, J.-P. Chaminade<sup>a</sup>, I. Imaz<sup>a</sup>, I. Koseva<sup>b</sup>, S. Pechev<sup>a</sup>, F. Bouree<sup>c</sup>, P. Peshev<sup>b</sup><sup>a</sup> ICMCB - CNRS, Université Bordeaux I, Pessac, France. <sup>b</sup> IGIC, Bulgarian Academy of Sciences, Sofia, Bulgaria. <sup>c</sup> L.L.B. (CEA-CNRS), CEA/Saclay, France. E-mail: graver@icmcb-bordeaux.cnrs.fr**Keywords: titanates, new phases, single-crystal structure determination**

Titanates occupy an important place among advanced oxide materials. After characterization of M<sup>II</sup>Li<sub>2</sub>Ti<sub>6</sub>O<sub>14</sub> compounds in the ternary oxide systems MO - Li<sub>2</sub>O - TiO<sub>2</sub> (M = Sr, Ba, Pb) [1],[2], two new titanates of Sr, Li and a 3d transition metal, SrLiM<sup>III</sup>Ti<sub>4</sub>O<sub>11</sub> (where M = Cr, Fe) were discovered. Single crystals were obtained by spontaneous nucleation using LiBO<sub>2</sub> as flux. The SrLiCrTi<sub>4</sub>O<sub>11</sub> structure was refined using 1491 independent reflections in orthorhombic space group *Pmna*, with a=13.818Å, b=5.755Å, c=9.901Å, Z=4, R<sub>1</sub>=0.021 and wR<sub>2</sub>=0.058. The SrLiFeTi<sub>4</sub>O<sub>11</sub> structure was refined using 5005 independent reflections in orthorhombic space group *Pbcn*, with a=13.878Å, b=11.496Å, c=19.895Å, Z=16, R<sub>1</sub>=0.036 and wR<sub>2</sub>=0.105. Structures can be described by the close-packed arrangement of strontium and oxygen atoms. The unit cell contains 6 "compact planes" perpendicular to [100] in the layer sequence ABACBC ((chc)<sub>2</sub>). Titanium, chromium or iron atoms occupy some of the created interstitial octahedral sites whereas lithium atoms are situated in tetrahedral sites. Depending on the synthesis conditions of SrLiCrTi<sub>4</sub>O<sub>11</sub>, the chromium and titanium atom distributions over the four allowed crystallographic sites are not the same. Having a similar compact-planes sequence, SrLiCrTi<sub>4</sub>O<sub>11</sub> and SrLiFeTi<sub>4</sub>O<sub>11</sub> structures differ in the arrangement of strontium and oxygen atoms per layer of close packing which also induces correlated variation in the Li-tetrahedra distribution.

[1] Koseva I., et al., *Z. Naturforsch.*, 2002, 57b, 512-518.[2] Koseva I., et al., *J. Alloys Comp.*, 2005, 389, 47-54.**m41.p14****Synthesis and structure of a cerium succinato-bridged ionic open-framework**N. Rahahlia<sup>\*</sup>, A. Guehria-Laidoudi<sup>\*</sup>, S. Dahaoui<sup>\*\*</sup>, C. Lecomte<sup>\*\*</sup><sup>\*</sup>Laboratoire CRI-THER, Faculté de Chimie USTHB, B P 32, El-ALLA, Bab Ezzouar, Alger, Algérie <sup>\*\*</sup>LCM<sup>3</sup> B, CNRS, UMR 7036, Université Henri Poincaré Nancy I, Faculté des Sciences, B P 239, 54506 Vandœuvre les Nancy Cedex, France. e-mail:guehria\_laidoudi@yahoo.fr**Keywords: polynuclear, succinate, rare-earth**

The area of hybrid open-framework materials based on carboxylate function, is currently of great interest owing to their features inducing catalytic and sorption properties. Their zeolite-like catalytic reactivity is a relatively recent attribute due probably to their crystalline nanoporous character.

Moreover, the flexibility of aliphatic dicarboxylic ligands, associated with connectivity of rare-earth metals, offer a great variety of coordination polymers extended into 1D, 2D or 3D via coordination bonding.

The hydrated cerium succinate, crystallizing with a counter ion (Cl<sup>-</sup>) has been obtained by an indirect synthetic route under reflux. Single crystals X-ray diffraction studies have been carried out at both room temperature (293K) and low temperature (120K).

Isostructural with the precedent lanthanum (III) succinate [1], it forms a layer-type polymeric structure built up from infinite Ce-O-Ce chains and self-assembled succinate ligands. The Ce atoms are ten-fold coordinated by six oxygen atoms of two symmetrically equivalent succinate ligands and four crystallographically distinct aqua ligands, to form edge-shared Ce O<sub>6</sub>(H<sub>2</sub>O)<sub>4</sub> bicapped square antiprism. The two end functional groups of the succinate ion are involved in the same syn-anti bridging-chelating mode and link the metal atoms through μ<sub>2</sub>-oxo bridges.

The hydrogen bonds crosslink the cationic layers into a 3 D open-framework and keep in place discrete chloride anions, and lattice water molecules.

As well as the lanthanum compound, [Ce(C<sub>4</sub>H<sub>4</sub>O<sub>4</sub>)(H<sub>2</sub>O)<sub>4</sub>.3H<sub>2</sub>O].Cl has high thermal stability and exhibits the same thermal behaviour. The removal of all lattice water molecules and three from four coordinated ones occurs in the temperature range 53-220°C and gives an intermediate anhydrous compound stable up to 320°C.

The heavier lanthanides (Nd and heavier) are often isostructural [2][3]. Besides, lanthanum and cerium are also isostructural, pointing to the influence of metal ion size and lanthanide contraction upon the structure, in this kind of materials.

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