Keywords: mesoporous materials, adsorption, charge density

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**Nanoporous metal phosphates with photoluminescence property**

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For the past two decades, research about metal silicate and phosphate with microporous structure has always played an important role in the field of materials chemistry due to their wide application potential from traditional catalytic, molecular sieve and ion exchange to recently developed low-k materials and zeolite dye laser. In recent years, we have discovered several gallium phosphates containing transition metal with pore size around 1 nm and intriguing photoluminescence property. For example, 24-member ring NTHU-11 and the first organo-metallo phosphates NTHU-2,2 can emit blue light when excited with UV light. The photoluminescence phenomenon is a new property of nanoporous metal phosphate with emission mechanism apparently different from that of existing inorganic phosphor since the later is doped with metal activator or added with sensitizer in host lattice in order to illuminate. At present, the photoluminescence property of nanoporous metal phosphate is substantiated. Besides blue light, zinc gallophosphate that can emit yellow light or even white light have been synthesized. In this presentation, we are going to present a series of nanoporous gallophosphates and zinc gallophosphates via the synthetic strategy of employing the large 4,4′-trimethylenedipyridine (tmdp) amine as a template. Their structures will be described and photoluminescence property will be examined.

References

Keywords: metal phosphate, photoluminescence, nanoporous

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**Crystal growth, structure and physical properties of Ln(CuGa)\(_3\) compounds (Ln = La-Nd, Eu)**

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Single crystals of Ln(CuGa)\(_3\) (Ln = La-Nd, Eu) compounds have been synthesized by flux-growth methods and characterized by single crystal X-ray diffraction. Ln(CuGa)\(_3\) (Ln = La-Nd, Eu), which are isostructural to NaZn\(_{13}\), crystallize in the cubic Fm-3c (No. 226) space group, with Z = 8 and lattice parameters a = 11.8 Å. Magnetic susceptibility data show paramagnetic behavior down to 2 K for Ce, Pr, Nd, and Eu compound, respectively. Metallic behavior is observed below 300 K for each compound. A large positive magnetoresistance up to 15% at 9 T is also observed for Pr(CuGa)\(_3\).

The structure, magnetic, heat capacity and transport properties of these compounds will be presented and compared to Ln(CuGa)\(_3\) (Ln = Y, Gd-Er, Yb) family of compounds.

Keywords: magnetism, magnetoresistance, flux growth

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**Structure and magnetic properties of a iron(III) spin crossover complex**

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New complex, [Fe(3-OMe-salMen)\(_2\)]\([Ni(mnt)\)_2]CH\(_3\)CN, (3-OMe-salMen=2-({[2-(methyl-amino)ethyl]imino}methyl)3-methoxysphenthion; mnt=maleonitriledithiolate) is synthesized and characterized. (at 298 K, triclinic P-1, cell parameters a = 9.402(2), b = 10.476(2), c = 16.636(3)Å, α = 87.17(3), β = 77.38(3) and γ = 75.21(3)°). The Fe(III) is an octahedrally coordinated (N,O) by two tridentate ligand. The bond lengths of Fe-N and Fe-O suggests the tridentate ligand. The bond lengths of Fe-N and Fe-O suggests the tridentate ligand. (CuGa)\(_{12}\) (Ln = La-Nd, Eu) compounds have isotostructural to NaZn\(_{13}\), crystallize in the cubic Fm-3c (No. 226) space group, with Z = 8 and lattice parameters a = 11.8 Å. Magnetic susceptibility data show paramagnetic behavior down to 2 K for Ce, Pr, Nd, and Eu compound, respectively. Metallic behavior is observed below 300 K for each compound. A large positive magnetoresistance up to 15% at 9 T is also observed for Pr(CuGa)\(_3\).

Keywords: spin crossover, iron (III), reversible

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**The local structure & dielectric properties of the cubic pyrochlore Bi\(_{1,67}\)M\(_{0,33}\)Nb\(_{5,0}\)O\(_{12}\) (M=Mg and Ni)**

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