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주최: KPS 사단법인 한국물리학회
후원: 대전컨벤션부로
ologies and phase transitions were investigated for the samples prepared at various annealing processes by using X-ray diffraction (XRD), scanning electron microscopy (SEM), photoluminescence (PL) and cathodoluminescence (CL), respectively. The room temperature PL spectra of CaTiO$_3$:Pr$^{3+}$ nanophosphors showed red emission peak at 613 nm. The bands at 613 from the $^3$D$_0$-H$_4$ transition of the Pr$^{3+}$ ion. The PL intensity of Li doped CaTiO$_3$:Pr$^{3+}$ nanophosphors had a maximum at Li$^+$ ion was 3%.

The purpose of this study is to compare the luminescence characteristics of Li doped CaTiO$_3$:Pr$^{3+}$ phosphors which were synthesized at Li ion concentration.

**Ep-039** Synthesis and luminescent properties of nanocrystalline Eu$^{3+}$-doped pyrochlore oxide $\text{M}_2\text{Sn}_2\text{O}_7$ (M=Y and Gd)

FU Zuoling, MOON Byung Kee, YANG Hyun Kyoung, CHOI Byung Chun, JEONG Jung Hyun

Recent work has been growing in interest on the synthesis of europium ions activated nanocrystals due to their promising applications in fluorescent lamps, field emission display and plasma display panels. $\text{M}_2\text{Sn}_2\text{O}_7$ stannates (M=rare earth) are conventionally prepared from solid state reactions at high temperatures ($\geq 1400 \degree$C). Besides their high energy consumption, these solid state reactions involve a series of laborious heating cycles at high temperatures and repeated grinding of starting oxide components. The resulting powders show extensive agglomeration and compositional inhomogeneity. Therefore, there is a real need to develop an alternative synthesis route for pyrochlore stannates. The hydrothermal synthesis technique has been shown to be promising in the preparation of complex oxides in terms of the relatively low reaction temperatures employed, high quality of the crystals obtained and, in some cases, reduction in sizes of the particles of the product solids. In this paper, $\text{M}_2\text{Sn}_2\text{O}_7$:Eu$^{3+}$ (M=Y, Gd) nanocrystals were prepared by hydrothermal synthesis method. Well-crystallized and phase-pure $\text{Y}_2\text{Sn}_2\text{O}_7$:Eu$^{3+}$ and $\text{Gd}_2\text{Sn}_2\text{O}_7$:Eu$^{3+}$ particles of 40nm and 20nm in size can be readily obtained at 900 $\degree$C, a temperature much lower than that of the conventional solid-state method, respectively. Furthermore, photoluminescence characterization of the Eu$^{3+}$-doped $\text{M}_2\text{Sn}_2\text{O}_7$ (M=Y, Gd) nanocrystals was carried out and the results show that the materials display intense and prevailing emission at 589nm belonging to the $^5$D$_0$-F$^7$F$^1$ magnetic dipole transition.

**Ep-040** Magneto resistance and thermoelectric power of iodine doped single wall carbon nanotubes

YOO HeNam, AHN SeJung, NAM YoungWoo, KIM YuKyung, PARK JiHyun, BAEK SeungJae, JIN Zhoxia1, PARK YongWoo

The room temperature dependence of four-probe dc conductivity and magneto resistance (MR) and thermoelectric power of the iodine-doped single-wall carbon nanotube (SWNT) mats. The temperature dependent conductivities of undoped and iodine doped SWNTs are similar to those of previous reports [1]. The MR is measured up to 14 tesla as a function of temperature. Negative MR is observed at T<20K. At T=4.2K, there is a negative minimum near H=8 tesla. As the temperature becomes higher, the negative minimum is flattened at high magnetic field. For 10K<30K, there exist small positive MR peak at low field becoming negative at high field. Above T=70K, the MR remained positive up to 14 tesla. Another sample shows similar temperature dependent MR but the turning point temperatures are higher than the previous sample. At zero magnetic field, the room temperature TE$P$ is positive and +14uV/K. It decreases upon cooling to T=2.7K. The positive TE$P$ indicates that the majority carrier in iodine doped SWCNT is hole. The magneto-TEP has been measured at H=7 tesla for T<100K. The magneto-TEP becomes smaller than the zero field TE$P$ value. At T=2.5K, the zero field TE$P$ is +0.15uV/K and the 7 tesla magneto TE$P$ is +0.14uV/K. For 20K<100K, the reduction of TE$P$ under magnetic field at low temperature could be due to the reduction of entropy per carrier since the magnetic field induces more ordered state of spins in the system. Detailed analysis of the magneto TE$P$ including the slope change as function of temperature are on going. Reference [1] L. Gregorian, K.A. Williams, S. Fang, G.U. Sumanasekera, A.L. Loper, E.C. Dickey, S.J. Pennycook, and P.C. Eklund, Phys. Rev. Lett. 80, 5560 (1998).

**Ep-041** X-ray Absorption Fine Structure study of TiO$_2$ Nanoparticles

JEON Jong-Sul, KIM Byung-Hyu1, HAN Sang-Wook2(전북대학교 과학기술대학원, 2전북대학교 물리학부)

We investigate the chemical and the structural properties of TiO$_2$ nanoparticles with mean particle size of 100 nm using X-ray absorption near edge structure (XANES) and extended X-ray absorption fine structure (EXAFS) at Ti K-edge. From XANES measurements on TiO$_2$ nanoparticles with anatase and rutile structures, clear A$_1$, A$_2$, A$_3$ pre-edge peaks were observed from the both structures meanwhile the only A$_1$ peak was sharp in Ti metal. The A$_1$ and A$_2$ peaks in the anatase structure are very similar to those in the rutile structure while the A$_3$ peaks slightly depend on the structure. The only A$_3$ peak was slightly changed as a small amount of sulfide was added. These results imply that the d-electrons in the A$_3$ level is more sensitive to the environment than the electrons in the A$_1$ and A$_2$ levels. We will discuss the XANES and EXAFS from the TiO$_2$ nanoparticles in detail, comparing with those of Ti metal. We also present the results of TiO$_2$ resistance effects to pathogenic bacteria and fungi.

**Ep-042** Reducing Oxidation Layer of Co and Ni Metal Nanowires Using High Energy Ion Implantation

주선수, 홍영기, 이용혁, 박성규(하이브리드 나노구조 연구실) 전기로조광방법을 사용하여 Al$_2$O$_3$ 나노 다결정질서에서 Co, Ni 금속 나노선을 합성하였다. 나노선의 직경은 200 nm이어서 나노선의 길이는 10 μm으로 조절하였다. 3차차 방식의 Kevronopotentiometry 방법을 사용하여 working 전극과 reference 전극 사이의 전압을 1V로 유지하여 금속나노선을 제작하였다. Ni 나노선의 제작을 위해서 사용된 용액은 Na$_2$SO$_4$:H$_2$O (270 g/L)와 H$_2$BO$_3$ (40 g/L)을 총정액에 용해 구성하였다. Co 나노선의 제작을 위해 사용된 용액은 CoSO$_4$×
Ep-043  Synthesis and Red Luminescence of CaTiO3 : Pr by Mechanochemical Alloying
Kim Hyoung, Myok Jong, Sung Whan (Seoul National University, Korea)

The preparation and photoluminescence of Pr3+ doped CaTiO3 by mechanochemical alloying was investigated by X-ray diffraction, scanning electron microscopy, energy dispersive X-ray spectrometer, thermogravimetric/differential thermal analysis and luminescence spectrometer. The corresponding emission spectra showed a emission range with a maximum peak at 615 nm, which was ascribed to the characteristic transition of Pr3+(1D2→H4), which can be expected for visible light conversion materials. The optimal condition of photoluminescence emission for CaTiO3 : Pr mixtures was 0.1mol% of Pr3+.

Ep-044  Optical characterization of In2O3 nano-particles embedded in the polyimide layer
Kim Seon-Bae, Lee Dong-Ok, Lee Tae-Hun, Hahn Seung-Jong, Kim Eun-Kyu, Kim Young-Ho (Quantum-Functional Spinics Lab. and Department of Physics, Hanyang University, Korea and Department of Materials Science and Engineering, Hanyang University, Korea)

We have fabricated metal-oxide nano-particles in polymeric matrix. This polymer layer has a possibility as tunneling and control layers for nano-floating gate memory. Specially, In2O3 has a direct band gap with energy of 3.6 eV and has been widely used in microphotodetector devices, such as solar cells, organic light-emitting diodes, panel displays, and gas sensors. The In2O3 nano-particles in a polyimide (PI) film were formed by a chemical reaction between the indium thin film and polycrystalline (PAA). Then, the PAA coated on the glass substrates by thermal evaporator and the PAA was spin coated on the deposited metal layer. The PAA precursor used in this study was prepared by dissolving biphenoxytetraazobenzoxazine 2,2'-diphenylfluorene 6,6'-diamine (BPA-PDA) commercial polycrystalline acid (PI2610D) in N-methyl-2-pyrrolidone (NMP). During the metal dissolving process, PAA and indium layer were maintained at room temperature for 24 hours. The PI precursor was treated at 135 °C for 30 min removing the solvent. Finally, the PAA/indium layers were cured at 300 °C~500 °C for 1~2 hour in N2 atmosphere for creates the In2O3 nano-particles. The In2O3 nano-particle size and distribution could be controlled by the curing temperature and time. In this study, the morphology and optical properties of In2O3 nano-particles formed in the PI layer were characterized by using transmission electron microscopy and UV-Vis spectrophotometry. We will be discussed the relation between size and absorption spectra of In2O3 nano-particles in the polyimide layer.