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**Nano-($Bi_{0.7}Pb_{0.3}$)$Sr_2Ca_2Cu_3O_{10}$ crystals synthesis by sol-gel improved with acrylamide and microwaves** E. CHAVIRA, F. FLORES, UNAM, A. CONDE, CINVESTAV, H. MONTIEL, D. CABRERO, C. FLORES, O. NOVELO, A. TEJEDA, G. ZAVALA, UNAM, L. ALMEIDA, G.E. TORRES, FQUJAT — We obtain ($Bi_{0.7}Pb_{0.3}$)$Sr_2Ca_2Cu_3O_{10}$ nano-crystals by sol-gel improved with acrylamide and microwaves, not reported in the literature. TGA gives an idea of the reaction temperatures (200-550 ° C) for the formation of binary, ternary and unknown materials. SEM and TEM shows morphology and crystal size 30-33 nm. We studied the thermodynamic and kinetic stability of the gel quenching, by varying the temperature and time according to a previous thermal analysis. Starting compounds (bismuth oxide, strontium carbonate, copper acetate, lead nitrate and calcium sulfate) were analyzed by XRD. By AFM we observed the dehydrated gel surface absorbed water from the environment. From the micrographs we measured the size of the fibers, grains and nano-crystals. We found at 560 ° C $Bi_{1.6}Pb_{0.4}Sr_2Ca_2Cu_3O_x$ compound with tetragonal crystal structure, corresponding to the 2:2:2:3 compound, with $T_c$ 110 K. At 860 ° C seen a shift of some reflections corresponding to two phases. Xerogel magnetic measurement shows antiferromagnetic behavior at 63 K.

Elizabeth Chavira
UNAM

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