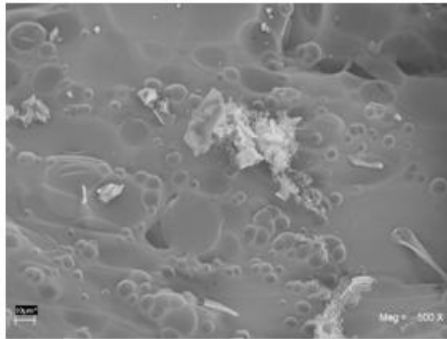


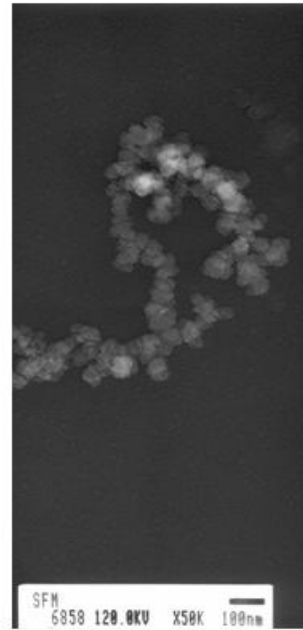
**SEM AND TEM CHARACTERIZATION OF THE  $Sr_2Fe(Mo_{1-x}Re_x)O_{6\pm z}$  ( $0.0 < x < 0.2$ ) SYSTEM USING THE ACRYLAMIDE SOL-GEL PROCESS VIA MICROWAVE, NEW SHINTESYS WAY TO CREATED NANOPARTICLES.** S. Rodríguez (1, 2), E. Chavira (1), E. Ramírez (1), J. Guzmán (1), L. Baños (1). (1) Instituto de Investigaciones en Materiales, UNAM, AP 70-360, 04510 México D. F., MÉXICO, (2) Facultad de Ciencias, UNAM, 04510 México D. F., MÉXICO. E-mail: [chavira@servidor.unam.mx](mailto:chavira@servidor.unam.mx)

Recently, the strontium iron molybdenum oxides, SFMO, have been considerate to present colossal magnetoresistance, due to their potential technological applications. In this study, we prepared the  $Sr_2Fe(Mo_{1-x}Re_x)O_{6\pm z}$  ( $0.0 < x < 0.2$ ) system using acrylamide gelation to form an organic three-dimensional tangled network, that we saw through Scanning Electron Microscopy (SEM), in a solution of the appropriate cations. Thus process has become a fast, cheap, reproducible and easy scaled up chemical route for obtaining nanocrystalline powders. By X-ray powder diffraction (XRD) analysis we observed the orthorhombic unit cell and calculated their lattice parameters. Also the particle size, shape, gel porosity and morphology of the polycrystals were examined by SEM Fig.1. The pores diameters of the gel are in the size range of 2 - 10  $\mu\text{m}$ . As a result of Transmission Electron Microscopy (TEM) we observed spherical clusters nanoparticles (10 – 60 nm) Fig. 2. It shows with  $x = 0.0$  that pure single phase powders of SFMO could be obtained at 210  $^{\circ}\text{C}$ . With an increase in the reaction temperatures, crystallite size increased. The powders were further pressed into pellets (13mm) and sintered at 1300  $^{\circ}\text{C}$  for 17  $h$  in air to obtained single phase for  $x = 0.2$ . With  $x = 0.2$  the structure presents an orthorhombic unit cell that is isostructural to SFMO compound (PDF 84-0995). Until know we have a 5% of *Re* solubility. In this work we improved the low temperature synthesis to obtained single phase of SFMO

We want to acknowledge the technical support of Fis. C. Flores and Fis. R. Reyes. This work was partially supported by UNAM-DGAPA-PAPIIT-IN102203 grant.



***Fig.1 Porosity of the gel.***



***Fig. 2 Nanoparticles (spherical clusters).***