

SYNTHESIS AND ISOLATION OF CARBON NITRIDE NANOCAGES

V. López¹, G. Román², A. Arregui³, L. Bañares³, E. Mateo⁴, J. Martín Gago⁵, J. Soler², J. Gómez Herrero², F. Zamora¹.

¹ Dpto Química Inorgánica. Universidad Autónoma de Madrid . Spain

² Dpto Física de la Materia Condensada. Universidad Autónoma de Madrid. Spain

³ Dpto Química Física I. Universidad Complutense de Madrid. Spain

⁴ Centro de Astrobiología (CSIC-INTA). Spain

⁵ Instituto de Ciencia de Materiales de Madrid, Física e ingeniería de superficie. Spain

vicente.lopez@uam.es

Carbon nitride nanoclusters have been prepared under mild solvothermal conditions by reaction between 1,3,5 trichlorotriazine and sodium azide in toluene. The bulk materials has a C_3N_4 composition and consists of spheres with diameters ranging from 1 nm to 4 μm . Nanometer-sized clusters of C_3N_4 stoichiometry have been adsorbed onto surfaces by sublimation of the bulk material or by simple physicochemical methods. These clusters have then been characterized by atomic force microscopy (AFM) and X-ray photoelectron spectroscopy (XPS). The laser desorption ionization mass spectra show peaks assignable to the $C_{12}N_{16}$, $C_{21}N_{28}$ and $C_{33}N_{44}$ subunit, respectively. The structure and stability of these new nitrogen-rich carbon nitride nanocages has been investigated by means of Density Functional calculations.



