SYNTHESIS OF CUPRIC OXIDE NANOWIRES FOR ITS PHYTOTOXIC ASSESSMENT IN THYME SEEDS
J. J. Elisea-Espinoza¹, S. Madrigal-Ortiz¹ and Dr. A. Medina-Ramírez²
¹Nanotechnology Engineering, Universidad de La Ciénega del Estado de Michoacán de Ocampo, Av. Universidad 3000 C.P. 59103, Sahuayo, Michoacán, México. ²Division of Natural and Exact Sciences, Universidad de Guanajuato, Noria Alta S/N C.P. 36050, Guanajuato, Guanajuato, México.

Along with the discussion of the enormous potential of nanomaterials, a debate about new and specific risks related to nanotechnologies has started. The implications of the special properties of nanoparticles with respect to health and safety have not yet been taken into account by regulators because there are few studies examining the effects of these new nanoparticles. This study reports the synthesis, characterization and the phytotoxic effect of cupric oxide nanowires. The synthesis was performed by the wet chemistry method, using copper acetate (II) monohydrate [(CH₃COO)₂•H₂O] as precursor of CuO. Sodium hydroxide (NaOH) and poly (4-vinylpyridine) was also used, but the amount of these two varied from one experiment to another in order to evaluate their effect on the morphology of the nanowires, thus obtaining different batches of nanowires. By the technique of Scanning Electric Microscopy (SEM) the morphological differences between the nanowires synthesized in each experiment, such their width and length, were evaluated. For the assessment of the phytotoxic effect of the CuO nanowires thyme seeds were used, which were separated in batches of 10 seeds and each batch was immersed for two hours in an aqueous solution (30 mg/L) of each batch of synthesized nanowires. Afterwards each seed lot was carried to the incubator for 4 days at 25 °C allowing the germination of the seeds in order to determine the values of germination rate, rate of root length and germination index of each batch and thus know if the material is phytotoxic and if it is, know the most important factors causing its phytotoxicity according to the morphological characteristics of each batch of nanowires.

Keywords: CuO-nanowires, phytotoxicity, thyme

References:


Presenting author's email: jjosue.elisea@gmail.com