

EXCITATION-INDEPENDENT BLUE-EMITTING CARBON DOTS FROM SILICA-BASED NANOREACTOR

Albina Mikhralieva, Henrique B. da Motta, Ricardo Aucélio de Queiroz, Volodymyr Zaitsev*

Pontifical Catholic University of Rio de Janeiro, 38097, Rio de Janeiro, Brazil

*e-mail: vnzaitsev@puc-rio.br

Several methods addressing the preparation of fluorescent carbon dots (CDs) have been recently reported. However, the control of morphology and size distribution of the produced nanomaterial is a challenge. Synthesis of excitation-independent carbon dots using porous silica gel, modified with aminopropyl groups, is presented in this work. Immobilized amines increase adhesion of the acidic precursor resulting in hydrophilic CDs into silica support. Improved washing protocol of prepared composite with both water and aqueous solution of NaHCO_3 is described as a way to decrease the content of non-target small particles. Fluorescent intensity of the nanoparticles, measured after the etching silica matrix from aminosilica composite with CDs, increased as the pyrolysis time varied from 15 to 60 min. Pore-size effect was also studied. Aqueous dispersions of the formed CDs nanoparticles presented intense blue fluorescence with emission maximum at 445 nm. Peak position of emission spectral band has not been changed with the variation of pore size in a range from 5 to 13 nm

