TAILORING STRUCTURAL AND PHOTOCATALYTIC PROPERTIES OF NITROGEN DOPED ZnSe/GO COMPOUNDS THROUGH FACTORIAL DESIGNS

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The present work was addressed to use the tools of a factorial design to tailor the physicochemical properties of ZnSe compounds and also testing those materials in the degradation of a lignocellulosic compound, lignin, which is a complex molecule derived from the paper production processes. The ZnSe photocatalysts were prepared under a two-level factorial design (2^3) through a chemical route using sodium selenite and zinc nitrate as precursors and processed in a microwave reactor at specific conditions of time, temperature and ramp heating. In a second stage, one of the ZnSe compounds was doped with nitrogen using urea or thiourea as nitrogen sources. Also, these compounds were supported on graphene oxide to improve their photocatalytic performance. Afterwards, the samples were characterized with SEM microscopy, X-Ray diffraction, XPS, Raman and UV-Vis spectroscopy. Also their specific surface area was determined and degradation studies under UV and Vis energy irradiation were carried out. It was determined that ZnSe/OG and ZnSe/OG nitrogen doped samples showed an improved behavior of 88 and 93% of lignin degradation in comparison to 24% for the pristine ZnSe compound, under UV irradiation.