**Abstract**

In the present work photocatalytic and [electrocatalytic activity](https://www.sciencedirect.com/topics/chemistry/electrocatalytic-activity" \o "Learn more about Electrocatalytic Activity from ScienceDirect's AI-generated Topic Pages) of CTS-GO and CTS-rGO composites synthesized by [ball milling](https://www.sciencedirect.com/topics/chemistry/ball-milling) method has been studied. The as synthesized composites were characterized for their structural, morphological and [optical properties](https://www.sciencedirect.com/topics/chemistry/optical-property). Compared to as prepared (Cu3SnS4) CTS; (Cu3SnS4-Graphene Oxide) CTS-GO and (Cu3SnS4-reduced Graphene Oxide) CTS-rGO composites showed enhanced electrocatalytic and [photocatalytic activity](https://www.sciencedirect.com/topics/chemistry/photocatalytic-activity" \o "Learn more about Photocatalytic Activity from ScienceDirect's AI-generated Topic Pages). Electrocatalytic activity experiments demonstrated that the CTS-GO and CTS-rGO composites exhibited large cathode current density, small Tafel slope and high stability in acidic medium. The photocatalytic activity of CTS-GO and CTS-rGO composites under the irradiation of visible light was evaluated by determining the degradation of [methylene blue](https://www.sciencedirect.com/topics/chemistry/methylene-blue" \o "Learn more about Methylene Blue from ScienceDirect's AI-generated Topic Pages) (MB). The CTS-GO and CTS-rGO composites exhibited an enhanced photocatalytic activity compared to bare CTS. The enhanced [photocatalysis](https://www.sciencedirect.com/topics/chemistry/photocatalysis" \o "Learn more about Photocatalysis from ScienceDirect's AI-generated Topic Pages) is due to the reduction in the recombination of the generated charge carriers, the increased absorption of light and improved dye absorptive with the incorporation of GO and rGO in CTS. The simple and efficient mechano-chemical strategy (ball milling) for preparation of the catalyst is more applicable to industrial production.