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Photocatalytic degradation efficiency of ZnO, GO and PVA nanoadsorbents for crystal violet, methylene blue and trypan blue dyes

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Abstract

Photocatalytic remediation has become a potential method for the industrial wastewater purification. In this treatment method optically active metal-oxide nanoparticle-based adsorbents are employed for the removal dyes and heavy metals from the industrial wastewater. In this work, we have studied polymer and carbon-based materials along with metal oxide nanoparticles. Zinc oxide (ZnO), graphene oxide (GO) and polyvinyl alcohol polymer nanoparticles in the degradation efficiency on the three vicious and most used industrial dyes crystal violet CV), methylene blue (MB) and trypan blue (TB) is reported. The synthesized nanoparticles

are characterized using XRD, SEM, FTIR and UV–vis spectroscopy for their structural and optical properties. Photocatalytic degradation efficiency of the nanoadsorbents on the various dyes was examined for 7 h and 24 h, and they were analyzed using UV and FTIR spectroscopies. Among all the three nanoparticle the GO has produced best degradation results on all the three dyes. © 2021 Elsevier GmbH

Author keywords

Crystal violet; Graphene oxide; Methylene blue; Nanoadsorbents; Photocatalytic degradation; PVA; Trypan blue; Zinc oxide

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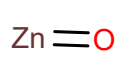
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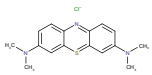
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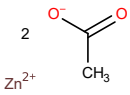
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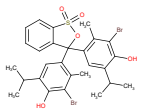
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