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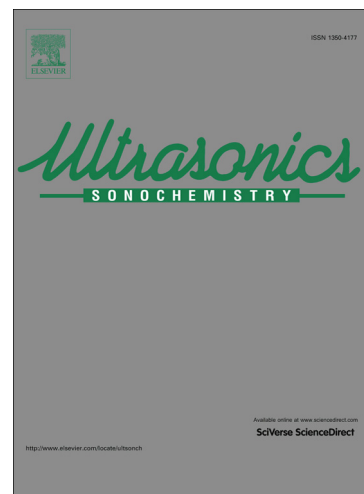
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**Combination of ultrasound-treated 2D g-C₃N₄ with Ag/black TiO₂ nanostructure
for improved photocatalysis**

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Herein, nanosheets of g-C₃N₄ (CN), prepared using a green ultrasonication process under various conditions, were combined with Ag/black TiO₂ nanocomposites (AgBT) to create two-dimensional (2D) CN/Ag/black TiO₂ tri-composites (CNAgBT). The thickness of the CN sheets varied with the ultrasonication conditions. The CNAgBT sample prepared using ultrasound-treated CN exhibited the highest average photocatalytic efficiencies for the degradation of two model pollutants, followed in decreasing order by AgBT, black TiO₂ (BT), sheet CN, bulk CN, and TiO₂. The order of pollutant degradation efficiencies by the photocatalysts was consistent with that of the charge carrier separation efficiencies. The degradation efficiency of the CNAgBT increased as the CN-to-AgBT ratio increased from 0.05 to 0.1, but decreased gradually for higher ratios between 0.15 and 0.20, indicating a lower optimal CN-to-AgBT ratio. A plausible photocatalytic degradation mechanism for the CNAgBT nanocomposites was proposed. Additionally, CNAgBT with a CN-to-AgBT ratio of 0.1 displayed a higher hydrogen generation rate with a maximum value of 21.5 mmol g⁻¹ over 5 h than

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