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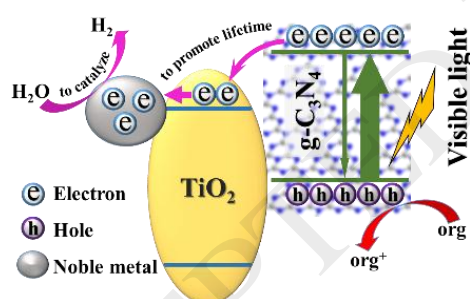
**Exceptional visible-light activities of g-C₃N₄ nanosheets
dependent on the unexpected synergistic effects of prolonging
charge lifetime and catalyzing H₂ evolution with H₂O**

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Graphical abstract



Synergistic effect between prolonging charge lifetime and improving catalyzing capability leads to improved H₂-evolution photoactivity.

Highlights

- Coupling a wide-bandgap semiconductor with a proper-energy platform like TiO₂ can prolong charge lifetime of g-C₃N₄.
- Decorating noble metal can improve the catalyzing capability for electron-induced H₂-evolution reactions.
- There is a synergistic effect between prolonging charge lifetime and improving catalyzing capability on improved activity.

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