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# Facile synthesis of flower-like $\text{Bi}_{12}\text{O}_{17}\text{Cl}_2/\beta\text{-Bi}_2\text{O}_3$ composites with enhanced visible light photocatalytic performance for the degradation of 4-tert-butylphenol

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## Graphical abstract

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## Highlights

- Novel flower-like  $\text{Bi}_{12}\text{O}_{17}\text{Cl}_2/\beta\text{-Bi}_2\text{O}_3$  composites were synthesized by a facile solvothermal-calcining route.
- The  $\text{Bi}_{12}\text{O}_{17}\text{Cl}_2/\beta\text{-Bi}_2\text{O}_3$  photocatalyst exhibits superior photocatalytic activity to 4-tert-butylphenol under visible light.
- The enhanced photocatalytic activity arises from the formation of heterojunction between  $\text{Bi}_{12}\text{O}_{17}\text{Cl}_2$  and  $\beta\text{-Bi}_2\text{O}_3$ .
- $\cdot\text{O}_2^-$  and  $\text{h}^+$  as main reactive species were found in the photocatalytic system.

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