

Photocatalytic Reduction of CO₂ on Bi₂O₃-Added Cu/TiO₂ Particles

정선일, 이도창[†]
한국과학기술원
(dclee@kaist.ac.kr[†])

Increasing atmospheric carbon dioxide (CO₂) concentration is a concern, as the relatively high heat capacity of carbon dioxide is considered to result in accelerated global warming. Highly efficient photocatalytic conversion of CO₂ demands the design of photocatalysts that offer stronger adhesion to CO₂ and the reaction intermediates. In this study, We report significantly enhanced gas-phase photocatalytic conversion of carbon dioxide to methane on Cu/TiO₂ nanoparticles when Bi₂O₃ is introduced as a promoter in the vicinity of Cu. CH₄ generation rate of 11.90 μmol/gh recorded in the case of Cu-Bi₂O₃/TiO₂ is an order of magnitude higher than the case of Cu/TiO₂. The enhanced catalysis is attributed to facilitated migration of CO* from Cu to Bi₂O₃ surface.