

## High efficient photoconversion of CO<sub>2</sub> on amine functionalized graphene with high activation of CO<sub>2</sub>

조경민, 김경환, 정현주, 정희태†

KAIST

(heetae@kaist.ac.kr†)

The human have been faced the two severe crisis of global warming and shortage of fossil fuel due to dramtic increase in comsumed energy. So, the photoreduction of CO<sub>2</sub> to valuable chemical fuel has been made attraction to consume the CO<sub>2</sub> and produce the sustainable and clean energ by only using sun light and water. To increase the efficiency of photocatalyst, the graphene has been utilized with various semiconductor composites to enhance the ability for efficient electron separation. However, the reported graphene based photocatalyst exhibit the low photoefficiency of CO<sub>2</sub> conversion. In this research, we design the CO<sub>2</sub> conversion system with high adsorption and activation of CO<sub>2</sub> to increase the reaction sites and affinity for CO<sub>2</sub>. Thus, we make the semiconductor wrapped by amine functionalized graphene followed by substitution for amine group on graphene surfaces which is the common CO<sub>2</sub> adsorbent with high affinity of CO<sub>2</sub>. This photocatalyst system shows the improved CO<sub>2</sub> affinities and high conversion rate for CO<sub>2</sub> without any noble metals.