

Colloidal Semiconductor Nanocrystals for Solar-driven CO<sub>2</sub> ConversionWang Nanfang, 이도창<sup>†</sup>

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Solar-driven carbon dioxide (CO<sub>2</sub>) photo-reduction into chemical fuels provides a sustainable way to produce renewable energy sources by consuming the ever-increasing greenhouse gas. Nevertheless, due to intrinsic inertness ( $\sim 750 \text{ kJ mol}^{-1}$  of C=O bond dissociation energy) of linear CO<sub>2</sub> molecule. Here, in an attempt to establish a universal guideline for rational design of stable photo-catalyst with high photo-conversion efficiency and selectivity for CO<sub>2</sub> conversion. We systematically investigate the structure-photocatalytic properties correlations using binary CdS colloidal nanocrystal (NC) as a model system. The colloidal CdS nanocrystal is chosen not only for the tunable band structure ( $\geq 2.41 \text{ eV}$ ) which can potentially afford visible light harvesting and sufficient energetic e<sup>-</sup> and h<sup>+</sup>, but also for the versatile controllability over its morphology, crystal structure and surface termination, which provides a broad monitoring window enable us to clarify the structure-property relationship in complex CO<sub>2</sub> photo-reduction process.