

## The surface modification of CdS photocatalyst by inorganic ions for the improvement of CO<sub>2</sub> reduction

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Carbon dioxide (CO<sub>2</sub>) conversion has been attracted many concerns due to the high greenhouse gas level in the atmosphere. The photocatalytic reduction of CO<sub>2</sub> is an attractive technology that uses directly solar energy to convert CO<sub>2</sub> into valuable chemicals in an environment-friendly way. However, the effective reduction process is not easy because the cathodic process has a high overpotential barrier with low selectivity to a certain product. Recent research focused on the utility of co-catalyst to improve the photocatalytic performance, while the effect of inorganic surface ligand remained largely unexplored. To the best of our knowledge, the only example where the inorganic ligands were used for photocatalytic CO<sub>2</sub> reduction is the use of Tetrafluoroborate (BF<sub>4</sub><sup>-</sup>) for the enhancement of yield. In this study, the effect of not only the capping anion ligands but also the cations on photocatalysis will be studied.