

### Photocatalytic reduction of carbon dioxide

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CO<sub>2</sub> is one of the major chemicals to cause the global warming and stored in an atmosphere because its natural circulation to the carbohydrates by the photosynthesis cannot come up with its excess production by the rapid development of industry. Photochemical reduction of CO<sub>2</sub> seems to be one of the ideal methods to artificially circulate CO<sub>2</sub> to its reduced forms, such as carbohydrates, because it mimics the natural photosynthesis only with solar energy. We studied the photochemical reduction of CO<sub>2</sub> using various photocatalysts and attempted to elucidate the conversion of CO<sub>2</sub> to its reduced forms of C1 chemicals, such as methanol, formic acid, methane, carbon monoxide, and form acetate. The catalytic activity was measured with GC using the liquid and gas phase products of CO<sub>2</sub> reduction, which has been further investigated using catalyst characterization methods of XRD, TEM, XPS, and UV-Vis.