

### Photocatalytic CO<sub>2</sub> reduction in H<sub>2</sub>O over Porphyrin sensitized Ti-TUD-1 catalysts

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Photocatalytic reduction of CO<sub>2</sub> with H<sub>2</sub>O under visible light is one of dream reactions with harnessing of light. It has been demonstrated that CO<sub>2</sub> could be converted into useful compounds such as carbon monoxide (CO), methane (CH<sub>4</sub>), methanol (CH<sub>3</sub>OH), formaldehyde (HCHO), and formic acid (HCOOH) by various semiconductor type photocatalysts.

In this study, porphyrin was used as a visible light photo sensitizer due to its efficiency in chorophore property in the visible range by giving soret and Q bands of absorption. And previously, Ti-TUD-1 was proved to be active for photo degradation of dyes. So, titanium containing TUD-1 was prepared and impregnated with Tetrakis(4-carboxyphenyl)porphyrin in order to be operated under visible light. This Por-Ti-TUD-1 was tested in the CO<sub>2</sub> reduction in water under visible light yielding CH<sub>3</sub>OH as the major product and also CO formation was confirmed in gas phase.