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Photo-catalytic reduction of carbon dioxide by means of different titania-based catalysts synthesized ZLWK KLJK SUHVVXUH ÀXLGV

5DIDHO &DPDULOOR 6 7RVWyQ)DELROD 0DUWtQH] &DUORV -LPpQH] ,VDDF $VHQFLR and [illegible]
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According to the latest IPCC Climate Change Synthesis Report the human in uence on the climate is clear, being recent anthropogenic emissions of greenhouse gases (GHGs) the highest in the history. In particular, CO_2 emissions from fossil fuel combustion contributed about 78% of the total GHG emission increase from 1970 to 2010, and these GHG emissions ar expected to grow in all sectors. In order to reduce emissions and mitigate storage concerns, conversion technologies utiliz the emitted CO_2 to produce other valuable products usually through catalytic chemical reactions. Given the high stability of CO_2 molecule, there is need for processes with high conversion and yield. ese objectives can be achieved with improved catalysts and reaction systems designs. Our group has acquired experience in photo-catalytic reduction of CO_2. In this sense, we have taken advantage of the special properties of compressed uids (they can di use through solids like a gas but dissolv materials like a liquid) as particle formation media to synthesize TiO_2-based catalysts with enhanced features. In particular, the photo-catalytic behavior of TiO_2 can be improved with the dispersion of metal atoms (Pt, Pd and Cu). is process has been undertaken simultaneously with supercritical synthesis in our ad hoc design experimental set-up, obtaining metal-doped TiO2 with high surface area, crystallization degree, hydroxyl concentration, large pore volume, improved absorbance in visible range, etc. As a result, they show higher conversion rates than commercial catalyst (22-fold in methane and 5-fold in CO) in reduction experiments developed in an ad hoc designed experimental set-up.

Biography

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