

Carbon Dioxide as Raw Material for the Energetic and Chemical Value Chain: Challenges and Opportunities for Catalysis

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Abstract

The use of CO₂ as carbon source offers the possibility to contribute to sustainable carbon cycles for energy and chemical value chains. The present lecture highlights some of the key scientific challenges associated with this concept and demonstrates the importance of catalysis research at the interface of molecular and engineering sciences in this area. The general aspects will be illustrated with current research from our laboratories concerning the development, application, and mechanistic understanding of catalysts and catalytic systems. Examples include the catalytic utilization of CO₂ for production of polymers [1], for catalytic hydrogenation to methanol [2] and methylation [3], and for formic acid synthesis [4] and carboxylation [5].