

Title: The Rheticus project

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Abstract

Climate change is one of the most discussed topics in our society at the moment. It is a common understanding, that CO₂ emissions contribute significantly to global warming. Therefore many different approach and efforts are needed to limit or even reduce these emissions. In order to approach this trend, we have to find solutions, efficiently using our resources and at the same time reducing CO₂ emissions. In our present world the natural photosynthesis is a crucial factor, generating compounds from CO₂ and sunlight and therefore reducing CO₂ in our atmosphere. The Rheticus project mimics the natural photosynthesis designing an artificial photosynthesis system.

The energy efficiency and water consumption of the natural photosynthesis are limiting factors. Artificial photosynthesis improves this energy efficiency and water consumption.

Our concept of an artificial photosynthesis is based on the combination of electrolysis and biocatalysis. At first CO₂ is transformed into an energetically superior gas mixtures by solar powered electrolysis. In a subsequent step this gas mixture is consumed by specially selected and designed bacterial strains, generating organic compounds. By this means bulk chemicals as well as specialties are accessible. Therefore this concept represents an additional interesting power to chemicals approach to preserve our current living standard in a sustainable manner.