

Artificial Photosynthesis: Generation of high value chemicals from CO₂ and sunlight by the combination of electrolysis and biocatalysis

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The electrification of process industry, changes in energy availability and the associated demand in decentral approaches for energy storage and energy usage are current challenges for the chemical industry.

Furthermore, Life-Cycle-analysis entered all areas of industry. The development of new technologies and processes at Evonik includes the consideration of carbon footprints and the influence of the technology to the environment.

Artificial photosynthesis describes a process converting CO₂, water and electrical current (e.g. electrical energy derived from sun light) to high value products. In contrast to natural processes we combine an electrochemical (Siemens) and a biotechnological (Evonik) technology in one module. The module converts CO₂ from various sources and uses electrical current from renewable energies.

The innovative method allows the creation of new value chains for the chemical industry. Energy companies (energy producer) can work together with chemical companies to hold our standard of living and quality of life. It protects fossil raw materials, reduce CO₂ emissions and opens possibility for a Power-to-Chemical approach.