

Electrolysis as the key to chemical and fuel production based on CO₂

From the point of view of climate protection, non-biological ways of using CO₂ require the use of electricity from renewable sources. In addition to plasma processes for the splitting of CO₂, which are still at a low TRL level, above all electrolysis processes that will play a decisive role.

Two approaches are to be distinguished:

- The production of hydrogen from water as a first step in the process chain for the use of CO₂. In addition to the chloralkali-electrolysis, in which hydrogen is produced as a by-product, commercially available technologies include PEM (Polymer Electrolyte Membrane) and alkaline electrolysis. Added to this is the high-temperature electrolysis (SOEC).
- Co-electrolysis of CO₂ in water - a recent development line. This makes it possible to produce CO or synthesis gas without a reverse water gas shift as an upstream step. Again, there are a low temperature and a high temperature variant.

The lecture will present the current status of development, technical challenges and the future availability of different technologies. In addition, recent results from the second phase of the BMBF-funded project Kopernikus P2X are presented and discussed in the overall context.