



Funded Dream Production project a success:

Plastic from CO₂ – a dream comes true

Bayer and partners develop alternative to petroleum

Carbon dioxide as the basis for high-quality plastics: Working together in a three-year research alliance, Bayer and partners identified promising new potential applications for the greenhouse gas. A common foam was produced with the help of power plant CO₂ as part of the publically funded Dream Production project. Because the carbon dioxide replaces a portion of the petroleum from which the foam is normally made entirely, the new process contributes to the conservation of limited fossil resources.

Comprehensive testing by Bayer has even shown some of the CO₂-based polyurethane foam's properties to be superior to those of conventionally produced material.

Polyurethane is used in many areas of daily life, including in mattresses, upholstered furniture, shoe soles and automotive components. It is also used as an insulating material for buildings and refrigeration equipment.

Pilot plant in Leverkusen

Bayer is initially using CO₂ in a pilot plant in Leverkusen to produce polyol, a key chemical precursor for polyurethanes, for testing purposes. The carbon dioxide is provided by project partner RWE, which separates it from the flue gas of a lignite-fired power plant outside Cologne. The CO₂ is chemically bound in the polyol and later in the polyurethane.

In early 2013, the new method was successfully converted from the production of discrete quantities to continuous production, a key intermediate step for the industrial-scale production of CO₂-based polyurethane, which Bayer is targeting for 2015.

Positive eco-balance

The process boasts a positive eco-balance, which means that the process results in an overall savings of carbon dioxide emissions. This was the finding of a comprehensive study conducted by RWTH Aachen University, another project member. An official announcement is expected shortly.

The process became possible when Bayer found a suitable catalyst, for which experts had been searching for over 40 years. The catalyst enables the efficient reaction of CO₂, which is normally slow to react. The special carbon dioxide catalysis process was codeveloped and is being further developed in collaboration with an additional project partner, the CAT Catalytic Center. This research facility in Aachen is funded jointly by the university there and Bayer.

Dream Production was funded in part by the German Ministry of Education and Research. The funding period expires in May 2013. Bayer will then continue the project and is looking for partners in the value-added chain to the consumer as the project moves to market maturity.