Carbon2Chem® - Converting Steel Mill Gases into Chemicals

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Abstract

The objective of the Carbon2Chem® project is to link the energy, steel and chemical industries within a cross-industrial production network. To demonstrate the sectoral coupling, thyssenkrupp has built a modern technical center with 2 MW alkaline water electrolysis, a pilot plant for gas cleaning and lab scale catalyst testing units. During the first phase of the project fundamental insights into the conversion of steel mill gases to chemical products were gathered.

After having successfully completed the first phase the Carbon2Chem® project got notice of further funding by the German Ministry of Education and Research (BMBF) for a second phase. The focus of the second phase is to proof the long term stability of the methanol and ammonia synthesis catalysts under conditions of purified steel mill gases and system integration. With the completion of the second phase an industrial implementation and basic engineering of the chemical complex including gas cleaning, chemical synthesis and electrolysis should be feasible. In addition to the issue of long term stability, Carbon2Chem® will also address other industries, such as steel production based on directly reduced iron, cement/lime plants and waste incineration.

In this paper recent results are presented and discussed in the light of availability of renewable energy and hydrogen.