Autothermal Chemical Looping Reforming (a-CLR):

Autothermal Chemical Looping Reforming (a-CLR) is an alternative technology for Steam Methane Reforming (SMR) facilitating CO\textsubscript{2} capture and the reduction of energy costs and allowing the elimination of intra-particle diffusion limitations and the use of more active catalysts. In a first stage, research aims at modeling and simulating the process using a catalyst used in conventional SMR. Detailed reaction kinetics is coupled with a circulating fluidized bed reactor model. The simulation tool developed allows evaluating the reactor performance at typical commercial operating conditions, an improved understanding of the technology, and process optimization and scale-up. In a second stage, catalyst optimization is aimed at. The intrinsic kinetics of the partial oxidation and steam reforming reactions and of the re-oxidation of the catalyst is studied by means of transient experimental techniques. The kinetic models derived from the experiments can be integrated in the a-CLR reactor model for evaluation of the catalyst performance at the commercial scale.

References: In progress.

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