



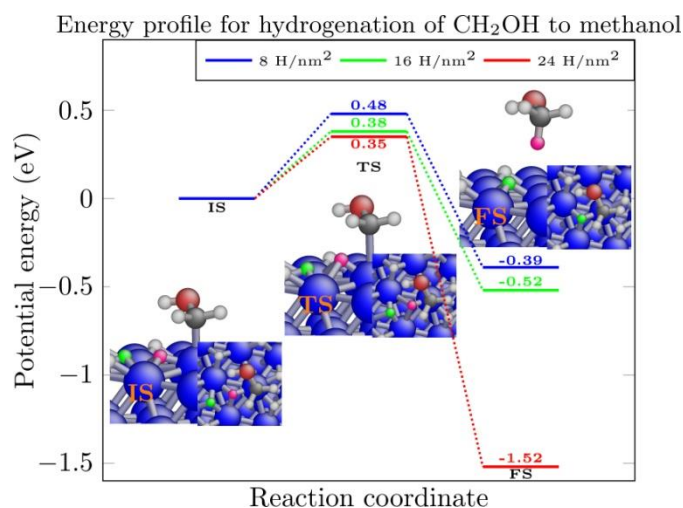
Reactive Atmospheric Plasma Processing Education Network – RAPID

Plasma is a partially ionized gas. It is called the “fourth state of matter”, next to solid, liquid and gas. A plasma consists of a large number of different species, i.e., not only gas atoms and molecules, but also ions, radicals, excited species, photons and electrons. **This “chemical cocktail” forms the basis of the many applications of plasma**, in materials science and microelectronics applications (coating deposition, etching, surface treatment), as lamps, lasers, plasma TVs, for environmental and biomedical applications.

RAPID (Reactive Atmospheric Plasma processing - eDucation network) is an interdisciplinary initial training network (ITN) at the intersection of chemistry, physics and engineering, aimed particularly at the development of non-equilibrium reactive processes in atmospheric pressure plasmas. RAPID involves emerging research topics, such as large area solar cells, barrier coatings to improve the permeation properties of polymers, and plasma conversion of greenhouse gases.

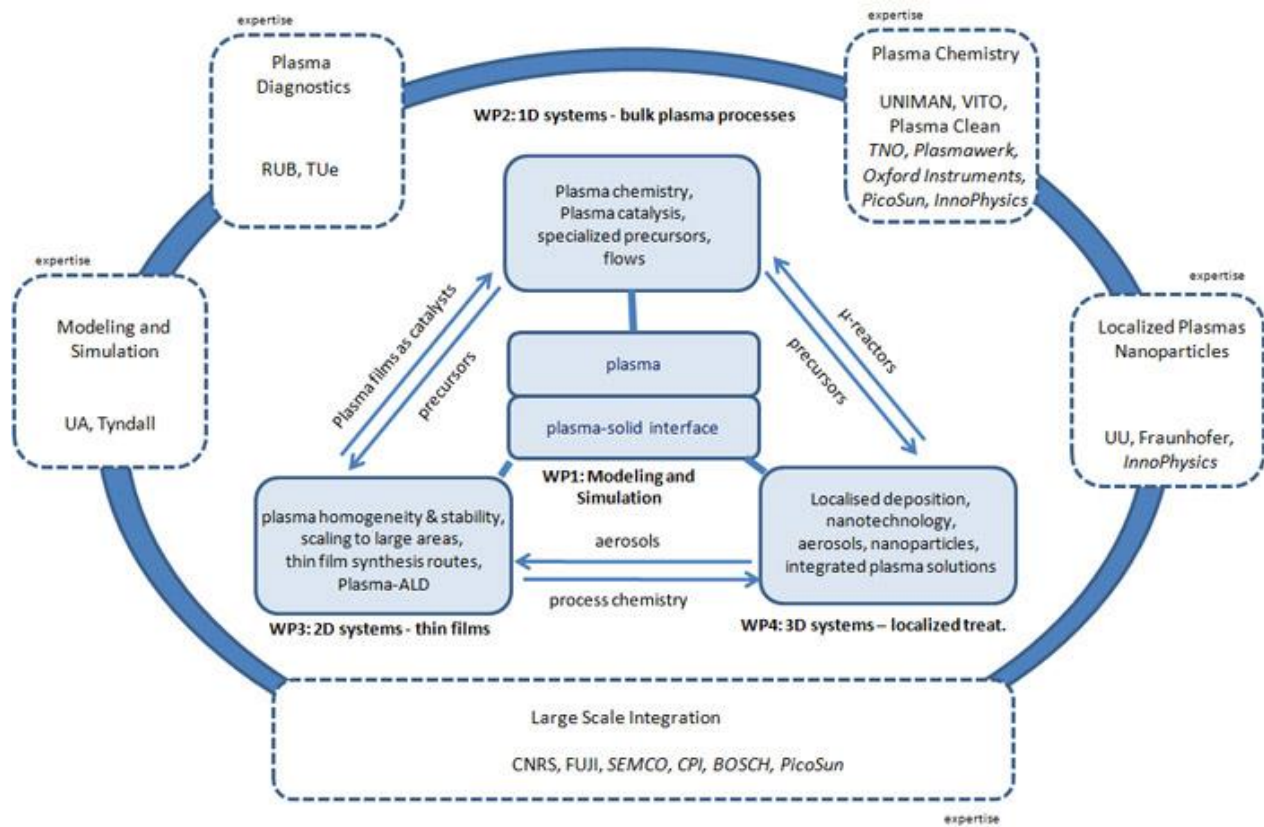
The group PLASMANT is involved in the topic on plasma conversion of greenhouse gases, by means of computer simulations and experimental validation. Indeed, plasma technology is gaining increasing interest for this application, because of its promising energy efficiency, and the possibility to combine with catalysis, for the selective production of value-added chemicals.

One PhD student and one postdoc are paid on this project. The PhD student is studying a microwave plasma for CO₂ conversion by means of the COMSOL Multiphysics Software, and investigating how the energy efficiency of the conversion can be improved. The postdoc is modeling the interactions of the plasma species with a nickel catalyst surface, by means of density functional theory calculations, to investigate the underlying mechanisms for the selective production of specific compounds.



The research success of RAPID requires a specific training, covering diverse aspects such as modeling and simulation of plasmas and surfaces, diagnostics to feed these models and the implications for industrial scale-up, and the realization of an interdisciplinary training involving the disciplines of physics, chemistry, and engineering.

RAPID creates the platform for a truly European PhD in plasma technology. This research and training is accomplished in a coordinated effort involving 10 academic and 10 industrial partners from 8 European countries, as illustrated below.



More information? Contact Prof. dr. A. Bogaerts (Research group PLASMANT)