

Frantz MARTIN, Dr., Eng.

I am currently an Expert Senior of the CEA (French Atomic Energy Commission). My research activities – and field of expertise – have been, for the last 15 years, focused on understanding the interactions of hydrogen and its isotopes with metallic materials. This research is dedicated to the whole process of interactions of a metal or an alloy (Fe-, Ni-, Zr-, Ti, based alloys mainly) with a hydrogen-rich environment, such as aqueous media (at different temperatures and pressures, with variable chemistry), hydrogen gas, and even extreme conditions such as irradiation (radiolysis and irradiation-induced defects formation). Relative studies focus at specific mechanisms, such as adsorption-absorption, diffusion – trapping in matter, desorption and interaction with mechanical stress. This lead me to design and develop dedicated specific experimental set-ups for exposure and analysis, as well as associated numerical tools for data treatment or modelling needs. This activity covers many application fields, from basic research (for instance, H-dislocation interactions in pure metals, irradiation effects, or trapping by carbides in model alloys), to nuclear activities (H absorption and permeation in primary water, transport and trapping, desorption), transport and storage of hydrogen (impact of the microstructure on the H distribution in alloys), as well as automotive or health industry. During all these years, I have developed trustworthy collaborations with academic partners in France (Universities of Grenoble-Alpes, La Rochelle, Toulouse, Orléans, Mines Paristech, Mines Saint-Etienne, Chimie Paristech) and in Europe (OCAS-NV (B), VTT (FI), ZAG & IMT (SLO)), as well as industrial collaborations (ArcelorMittal R&D, Ugitech, Naval Group, EDF, Framatome, TotalEnergies).