Labex MATISSE

MRI study of alumina support impregnation by aqueous, metal salt solutions

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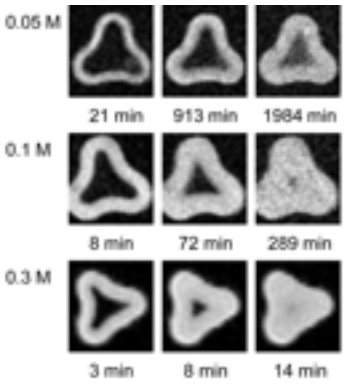

The rate at which metal ions penetrate through the alumina support, here shown as the light areas on the images, differs as a function of the initial ion concentration.

Hosting laboratories, teams and thesis supervisors names:

UPMC, LCMCP, Flavien Guenneau
IFP Energies Nouvelles, Anne-Agathe Quoineaud

Research project

An improved performance and refining of heterogeneous catalysts are major challenges, especially for their application to non-fossil resources. Among the technical and scientific challenges identified, understanding the phenomena occurring on the inner surface of the oxide supports during the dry impregnation step is essential. The aim of this study is to rationalize the role of the media (porosity, texture, connectivity) on phenomena such as the spread of species during impregnation. This is to be done by MRI in situ study of the impregnation of metal salts in alumina supports. Technique optimization, in terms of resolution and signal-to-noise (S / N), is planned in order to establish the conditions for a quantitative analysis of the images.

Summerize your scientific results & impacts

I have established an improved experimental routine, permitting better comparison of the obtained results. I have confirmed the results previously obtained on the project and wrote an article (now submitted to an international journal). The results are pertinent to catalyst preparation process.
I have written MatLab code for data analysis. Together with IFP Energies Nouvelles, we are working on other methods of data analysis.

Main key facts (for instance publications / prices / oral presentations)

An article: “Magnetic Resonance Imaging *in situ* study of the impregnation of γ-alumina pellets” submitted to *Applied Catalysis A: General*