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► To cite this version:

Florence Charlier, Delphine Canion, Philippe Marc, Alastair Magnaldo, Sophie Lalleman, et al.. Dissolution of uranium dioxide in nitric medium, towards a macroscopic model of reactors. Joint 10th European Congress of Chemical Engineering & 3rd European Congress of Applied Biotechnology & 5th European Process Intensification Conferences, Sep 2015, Nice, France. http://www.ecce2015.eu/>

HAL Id: cea-01260743 https://hal-cea.archives-ouvertes.fr/cea-01260743

Submitted on 22 Jan 2016 $\,$

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Dissolution of uranium dioxide in nitric medium,

towards a macroscopic model of reactors.

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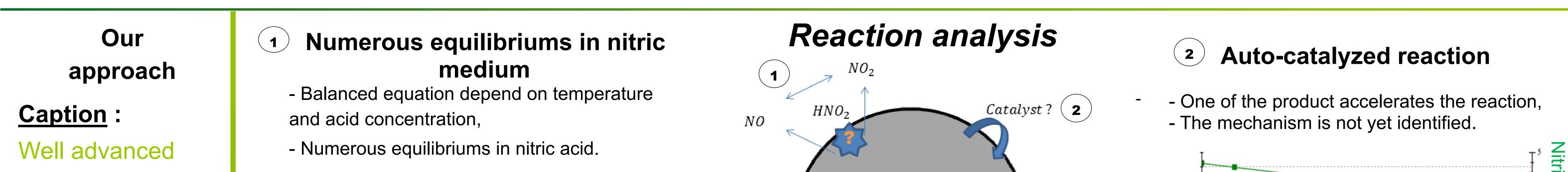
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Introduction

Dissolution plays an important part at the head of many industrial processes. It is a key step for the recycling of rare metals and also uranium dioxyde, mainly present in spent nuclear fuel. However, heterogeneous reactions are particularly complex in those cases as they are triphasics and catalyzed by one of their products.

Dissolvers could be optimised with a good knowledge of the physiso-chemistry implied in this kind of reactions. Hence, this work focuses on developping a model of the reactor including all the caracteristics of the dissolution and their effects on the kinetics.







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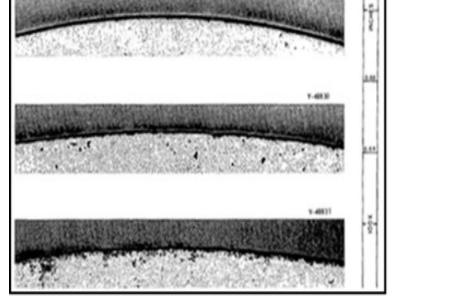
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Ongoing Next episode

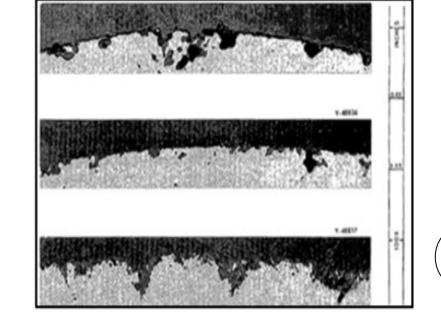
Comprehension of phenomena involved in the dissolution

5 Heterogenous attack of the solid - Increase in the specific surface at the beginning of the

reaction, - Greater activity in the pits created during dissolution.

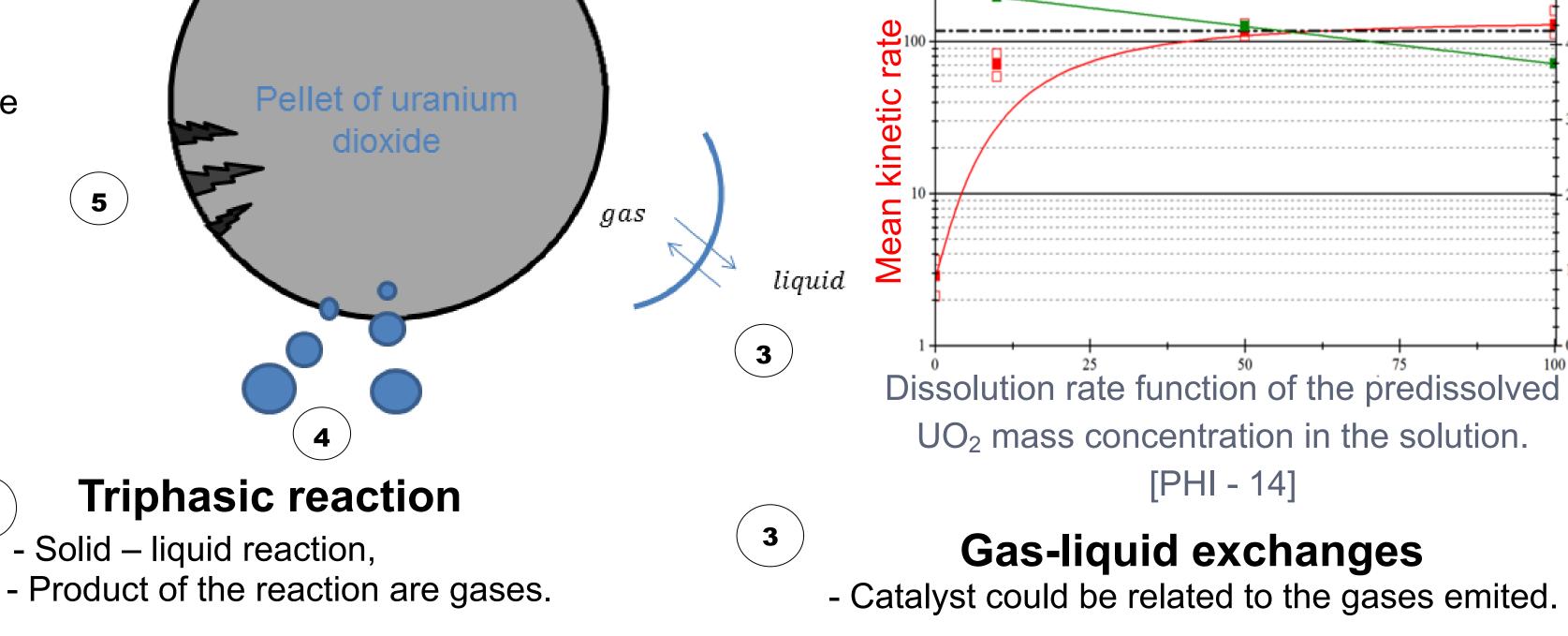


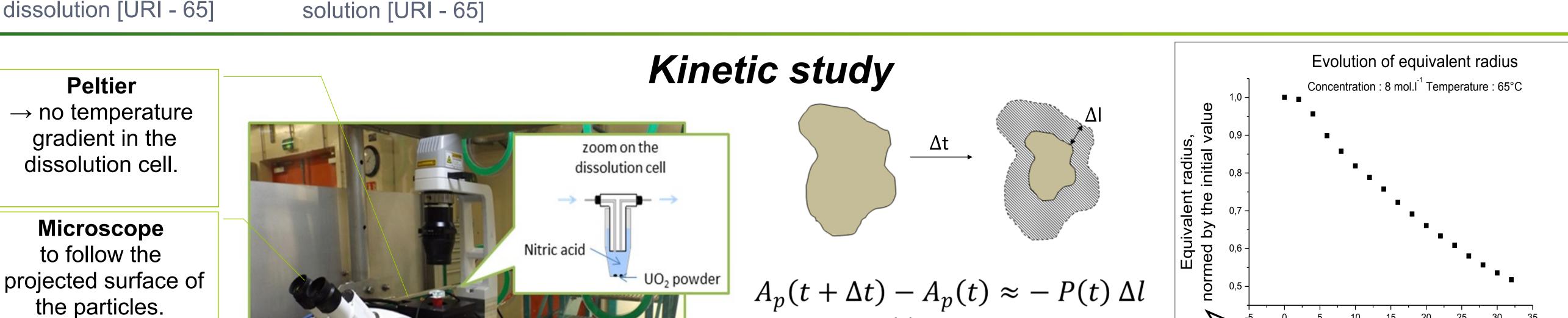
Pellet surface before dissolution [URI - 65]



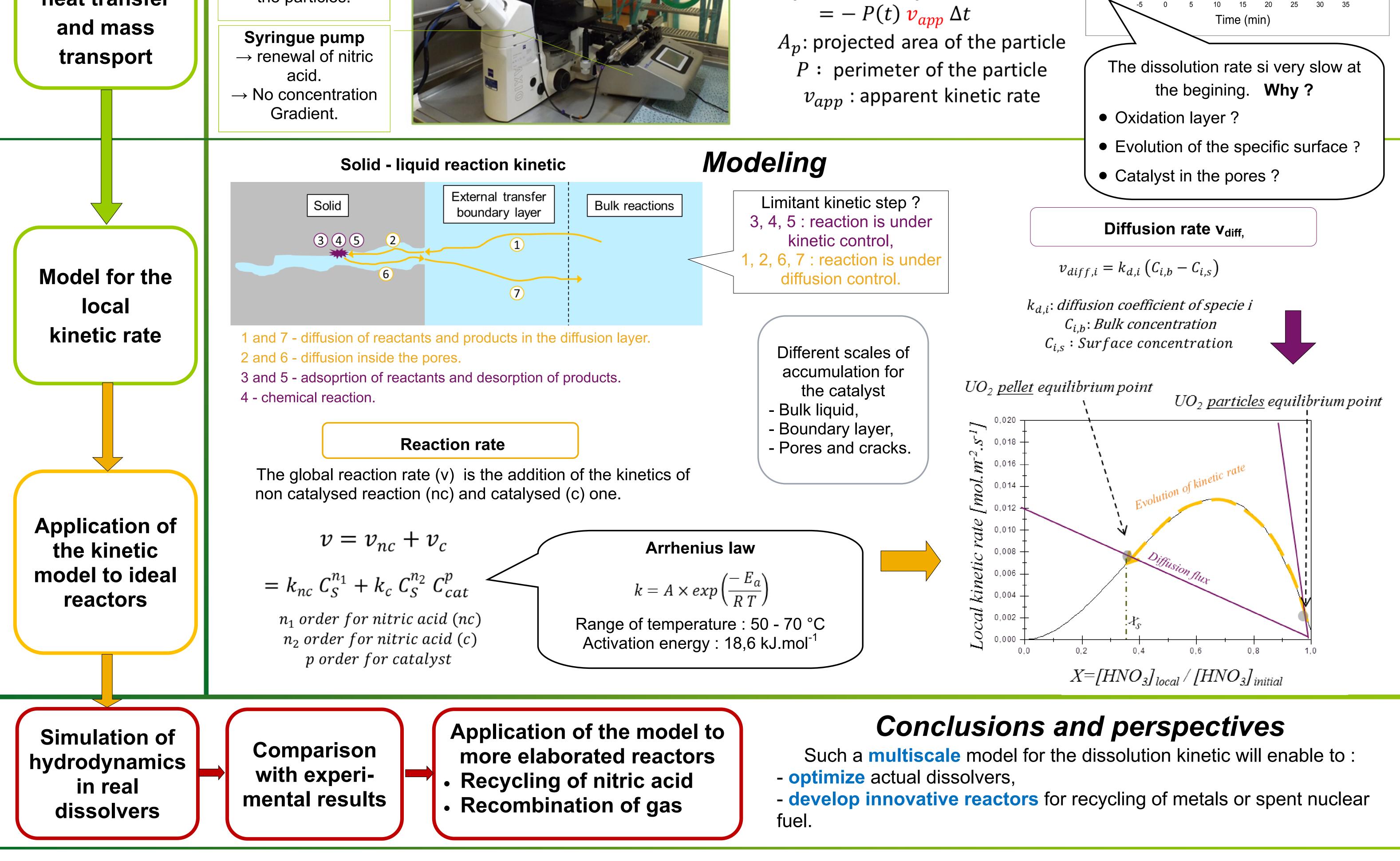
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Pellet surface after dis-





Kinetic study without influence of heat transfer



[PHI - 14] P. MARC, Etude de réactions hétérogènes autocatalytiques. Application à la dissolution du dioxyde d'uranium. Thèse de l'université de Lorraine, 17 décembre 2014. References [URI - 65] A. L. URIARTE & R. H. RAINEY, « Dissolution of high-density UO₂, PuO₂, and UO₂-PuO₂ pellets in inorganic acids », Document technique ORNL, Réf. ORNL-3695, avril 1965.

10th European Congress on Chemical Engineering - September 2015