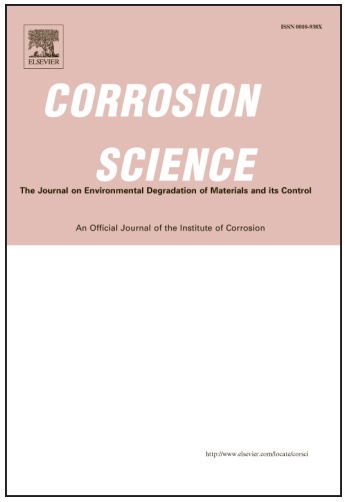

Influence of an aerated/anoxic transient phase on the long-term corrosion of iron

Mandana Saheb, Jean-Paul Gallien, Michael Descostes, Louis Raimbault, Andréa Perez, Delphine Neff, François Marsal, Delphine Pellegrini, Philippe Dillmann

PII: S0010-938X(14)00211-X
DOI: http://dx.doi.org/10.1016/j.corsci.2014.04.040
Reference: CS 5834

To appear in: *Corrosion Science*

Received Date: 21 February 2014
Accepted Date: 28 April 2014

Please cite this article as: M. Saheb, J-P. Gallien, M. Descostes, L. Raimbault, A. Perez, D. Neff, F. Marsal, D. Pellegrini, P. Dillmann, Influence of an aerated/anoxic transient phase on the long-term corrosion of iron, *Corrosion Science* (2014), doi: http://dx.doi.org/10.1016/j.corsci.2014.04.040

Influence of an aerated/anoxic transient phase on the long-term corrosion of iron

Mandana Saheb[(1)*], Jean-Paul Gallien[(1)], Michael Descostes[(2)], Louis Raimbault[(3)], Andréa Perez[(1)], Delphine Neff[(1)], François Marsal[(4)], Delphine Pellegrini[(4)], Philippe Dillmann[(1)]

(1) LAPA/SIS2M, UMR 3299 CEA/CNRS et LMC IRAMAT UMR5060 CNRS, CEA Saclay 91191, Gif-sur Yvette Cedex, France

(2) AREVA, Mining Business Group, 92084 Paris la Défense, France

(3) MINES ParisTech, Centre de Géosciences, 35 rue Saint Honoré, 77305 Fontainebleau Cedex, France

(4) IRSN/PRP-DGE/SEDRAN, BP17, 92262 Fontenay-aux-Roses Cedex, France

This paper deals with the influence of an aerated/anoxic transient phase on the corrosion of ferrous matters. Actually in the context of radioactive waste disposal, metallic components could be exposed to fluctuating environmental conditions that could change the corrosion mechanisms and influence the corrosion rates. Archaeological analogues corroded in an aerated soil were exposed to an aerated/anoxic transient in an isotopic labeled solution. The corrosion mechanism in anoxic conditions does not seem to be influenced by the pre-existing thick corrosion layer formed in an aerated environment and the estimated corrosion rate is of few micrometres per year.

Keywords:

Iron, Raman spectroscopy, SIMS, thermodynamic diagrams

* Current address: LISA, UMR CNRS 7583 Paris-Est Créteil /Paris Diderot/CNRS, 94010 Créteil Cedex, France, mail : mandana.saheb@lisa.u-pec.fr, tel : +33145171675