

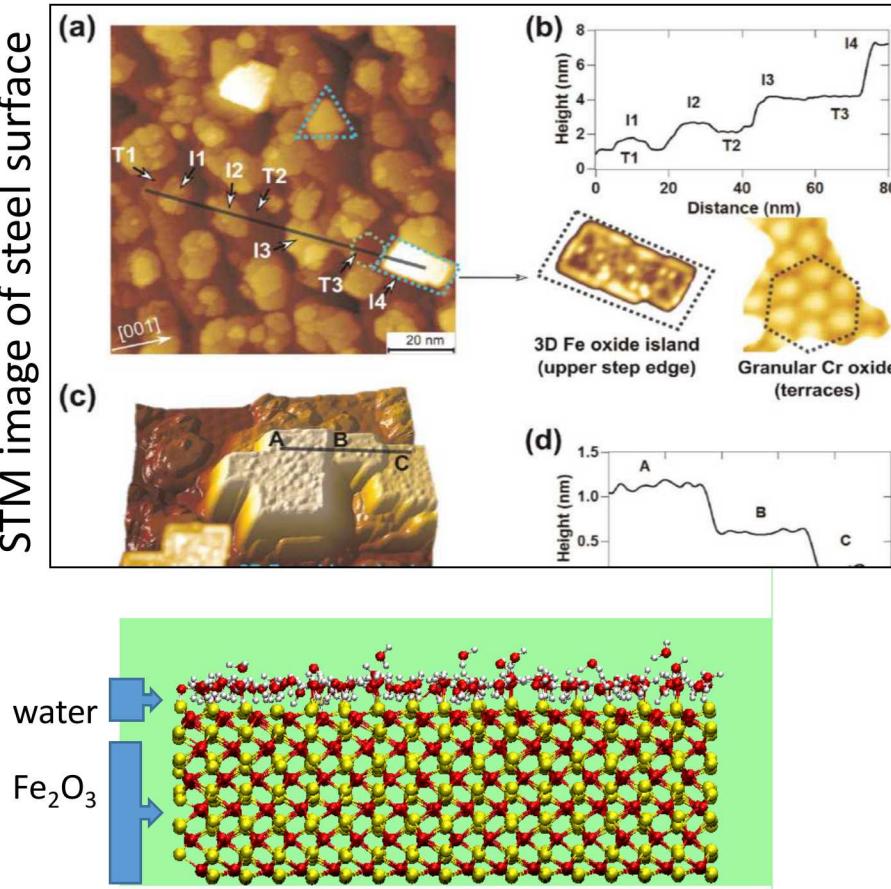
Sandia's Z-machine: GCLD

This paper describes objective technical results and analysis. Any subjective views or opinions that might be expressed in the paper do not necessarily represent the views of the U.S. Department of Energy or the United States Government.

atmospheric corrosion

- 25 M ampere current in steel electrode
- heats up electrode, desorbs water
- Reduce current delivered to Z load

STM image of steel surface



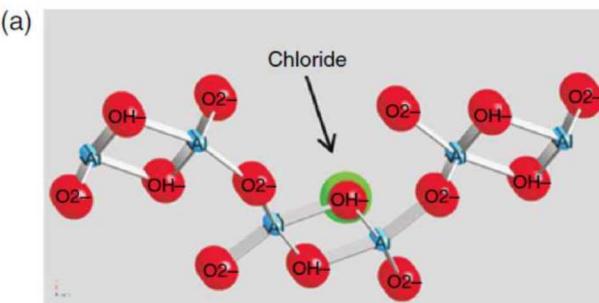
Perform CLAYFF and DFT molecular modeling to understand, reduce amount of water desorption

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- Geochemists haven't seen that (thanks to Louise Criscenti)

Cl doesn't hasten oxide dissolution

- Cl⁻ known to be a main cause of Al pitting corrosion



2017 W.R. Whitney Award: Perspectives on Chloride Interactions with Passive Oxides and Oxide Film Breakdown P.M. Natishan[†]

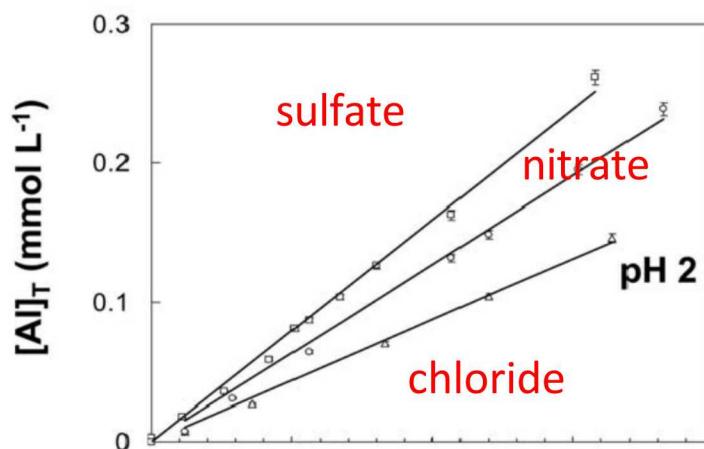
CORROSION—Vol. 74, No. 3

- claims XANES data shows AlOH \rightarrow AlCl surfaces substitution, somehow degrades oxide

The dissolution rates of gibbsite in the presence of chloride, nitrate, silica, sulfate, and citrate in open and closed systems at 20°C

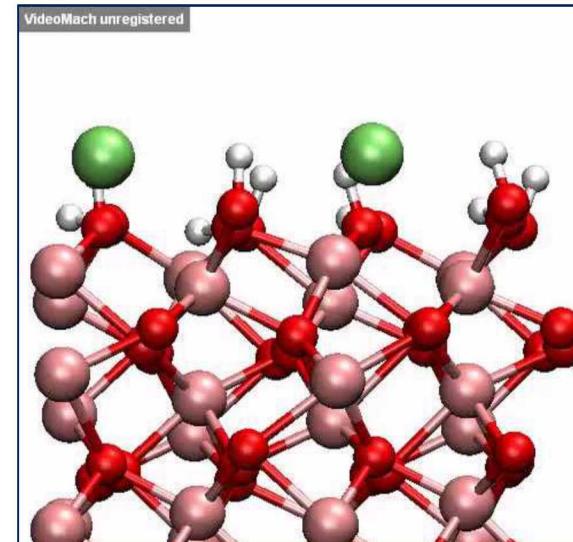
M. DIETZEL^{1,*} and G. BÖHME²

Geochimica et Cosmochimica Acta, Vol. 69, No. 5, pp. 1199–1211, 2005



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Our DFT-MD simulations

Water-mineral Interactions in Plasma Grand Challenge LDRD and Advanced Scientific Computing Corrosion Programs

Kevin Leung

Sandia National Laboratories

Acknowledgement

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