Scope of OLI corrosion technology
ALLOYS
February 2019

Phase equilibria and speciation
Critical information for understanding corrosion mechanisms, are calculated for the full OLI chemistry

Stability diagrams
Available for the full OLI chemistry in contact with any metal surface

Electrochemical kinetic parameters for alloys

Kinetic rate parameters have been explicitly calibrated for the following alloys:

- Carbon steel
- Stainless steels: 13% Cr (type 410), 304, 316, 254SMO, 2205 duplex
- Nickel-base alloys: C-22, C-276, 625, 825, 600, 690 and Ni
- Copper-base alloys: Cu, CuNi9010, CuNi7030
- Aluminum
- 2507 duplex, Alloy 28, Alloy 29, Alloy 2535

The kinetic model includes

- Prediction of the rates of general corrosion
- Prediction of the corrosion potential
- Prediction of the repassivation potential
- Tendency for localized corrosion & maximum propagation rate of individual pits

Alloys scheduled for the Corrosion Analyzer
Super 13Cr, Super 15Cr

Extreme Value Statistics
Prediction of the evolution of corrosion damage with time using Extreme Value Statistic

Are the alloys you use on OLI's list?
OLI's alloy development is set by clients who sponsor alloy development, and by research projects that provide funding for additional alloys. If you would like to see an alloy that is important to you given priority treatment:

Add an Alloy OLI will provide cost-sharing and co-funding with you for adding an alloy of your choice. Please request an estimate.

Scope of OLI corrosion technology

CHEMISTRY

February 2019

Phase equilibria and speciation

Critical information for understanding corrosion mechanisms are calculated for the full OLI chemistry.

Stability diagrams

Available for the full OLI chemistry in contact with any metal surface

Kinetic parameters for chemistry

Neutral species H_2O, O_2, CO_2, H_2S, N_2 and all inert gases, Cl_2, SO_2, S^o and NH_3, organic molecules that do not undergo electrochemical reactions

Anions OH^-, Cl^-, Br^-, I^-, F^- (only for Ni-base alloys and type 316 stainless), HCO_3^-, CO_3^{-2}, HS^-, S^{2-}, SO_4^{2-}, HSO_4^-, SO_3^{2-}, NO_2^-, NO_3^-, MoO_4^{2-}, CN^-, ClO_4^-, ClO_3^-, ClO^-, acetate, formate, Cr(VI) anions, As(III) anions, P(V) anions, W(VI) anions, B(III) anions and Si(IV) anions.

Cations H^+, alkali metals, alkaline earth metals, Fe(II) cations, Fe(III) cations, Al(III) cations, Cd(II) cations, Sn(II) cations, Zn(II) cations, Cu(II) cations, Pb(II) cations and NH_4^+, V, Co, Pd, Fe(III)

Species not expected to have an effect on corrosion most organic neutrals

Chemistry scheduled for the Corrosion Analyzer

Localized corrosion in environments containing H_2S, CO_2, and Cl

Mixed Solvent Chemistry (MSE) in the Corrosion Analyzer

OLI Studio: Corrosion Analyzer gives you full access to thermodynamic calculations using OLI's Mixed-Solvent Electrolyte Model as well as the aqueous model. **However, the corrosion kinetics is available only in conjunction with the aqueous model.** OLI is planning to combine the MSE model with corrosion kinetics. This project is underway.

For your chemistry If your company is interested in specifying a priority system as part of this effort, please contact us for details on how to form a partnership and receive priority treatment for your chemistry.