Temperature and Relative Humidity Dependence on Corrosion of 304L Stainless Steel Teardrops Exposed to CaCl2

Juan G. Duque, Josh Narlesky, John M. Berg, MaryAnn Hill, Elizabeth Kelly, Laura Worl, and Douglas K. Veirs

Los Alamos National Laboratory, Los Alamos, NM 87545

Here we show the strong dependence of temperature and relative humidity (RH) on corrosion of 304L stainless steel 'teardrop' coupons. We will show evidence that stress corrosion cracking (SCC) is more significant at 50 than at 30 degrees ^{o}C and close to the deliquescent RH of $CaCl_2$ than at higher RHs. Using imaging techniques, we were able to quantify the SCC and corrosion pitting. At 30 degree C SCC declines and pitting increases with increasing RH (between 22 and 50%).