GEOL 135 Next-day assignment due 11-1-09 Fall 2010

The Rate Law for Fe2+ oxidation between pH 4 and 7 is defined by the rate law:



Where k=8.0 x 1013 L2 mole-2 atm-1 min-1 at 25°C. Calculate the rate of oxidation for ferrous iron at pH 4, and 7 and saturated O2 conditions (PO2=0.21 atm) with 100 uM ferrous iron (approximately analogous to conditions at the Ely Brook). Assume for all calculations that the activity coefficient is 1 (and use partial pressure in atm for O2)

At pH<3, the rate law for Fe2+ oxidation is:



Where k=1.0 x 10-7 atm-1 min-1 at 25ºC. Determine the rate of reaction at pH 2.5 under partially saturated O2 conditions (PO2=0. 1 atm) with 1000 uM Fe2+ (conditions approximate to groundwater at Ely).