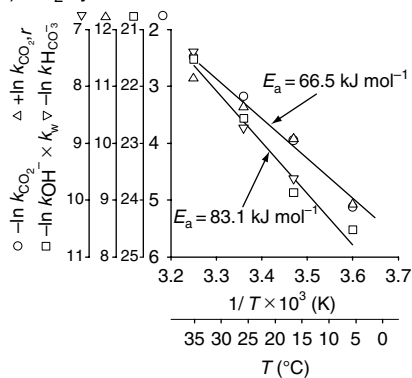
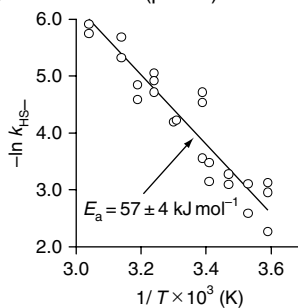
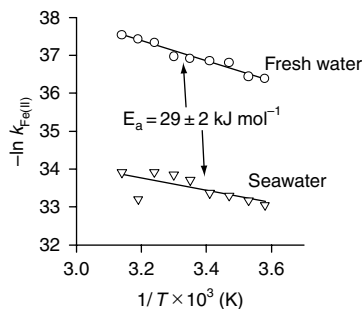
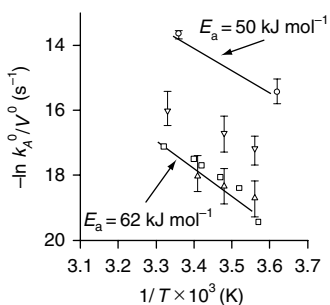


(A) CO₂ hydration(B) HS⁻ oxidation (pH = 8)

(C) Fe(II) oxidation

(D) SiO₂ dissolution**Figure 9.6.** Temperature

dependence of environmentally important reaction rate constants.

(A) CO₂ reaction with H₂O or OH⁻ in seawater. The data are plotted so that the slope of the line is the Arrhenius activation energy, E_a , divided by the gas constant, R ($8.315 \text{ J mol}^{-1} \text{ deg}^{-1}$) (Johnson, 1982). (B) HS⁻ oxidation (Millero *et al.*, 1987a). (C) Fe(II) oxidation in seawater (Millero *et al.*, 1987b)

(D) The dissolution rate constants for opal as a function of temperature. The values plotted here are normalized to a constant area:

volume ratio, $A^0/V^0 = 10 \text{ cm}^{-1}$.

The high dissolution rate constants (circles) are for acid-cleaned siliceous sediments (Hurd, 1972); the squares are data for peroxide and acid-washed plankton (Lawson *et al.*, 1978); and the other results (triangles) are for two untreated single species of diatom (Kamatani, 1982).