

7. Using chemical reactions and equilibrium expressions show that solubility of silica in waters is a function of pH. State your assumptions. [6]

8. Determine the concentrations of carbonate, bicarbonate and carbonic acid in a water supply if the total amount of inorganic carbon dissolved in it is $85 \mu\text{g/mL}$ and its pH is 7.9. What is the partial pressure of CO_2 which would be in equilibrium with this water? The water also contains $6 \mu\text{g/mL}$ of Ca^{2+} . Is the water saturated with respect to calcite? (Given $K_1 = 10^{-6.35}$, $K_2 = 10^{-10.3}$, $K_{\text{CO}_2} = 10^{-1.5}$, $K_{\text{cal}} = 10^{-8.35}$). Assume $a = m$. [6+2+3]

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