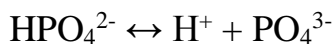


Answer on the Question 77545 Chemistry / General Chemistry

$$C(\text{H}_3\text{PO}_4) = 2 \text{ mol/L}$$



$$K_{a1} = \frac{[\text{H}^+][\text{H}_2\text{PO}_4^-]}{[\text{H}_3\text{PO}_4]}$$

$$7.1 \cdot 10^{-3} = \frac{x^2}{2}$$

$$x^2 = 2 \cdot 7.1 \cdot 10^{-3} = 0.0142$$

$$x = 0.119$$

$$[\text{H}_2\text{PO}_4^-] = 0.119 \text{ mol/L}$$

$$K_{a2} = \frac{[\text{H}^+][\text{HPO}_4^{2-}]}{[\text{H}_2\text{PO}_4^-]}$$

$$6.3 \cdot 10^{-8} = \frac{x^2}{0.119}$$

$$x = 8.66 \cdot 10^{-5}$$

$$[\text{HPO}_4^{2-}] = 8.66 \cdot 10^{-5} \text{ mol/L}$$

$$K_{a3} = \frac{[\text{H}^+][\text{PO}_4^{3-}]}{[\text{HPO}_4^{2-}]}$$

$$4.2 \cdot 10^{-13} = \frac{x^2}{8.66 \cdot 10^{-5}}$$

$$x = 1.9 \cdot 10^{-6}$$

$$[\text{PO}_4^{3-}] = 1.9 \cdot 10^{-6} \text{ mol/L}$$

Answer provided by AssignmentExpert.com