

Please show all equations and all work to receive any credit

Phosphoric Acid (H_3PO_4) is a triprotic acid that reacts with water as an acid with three K_a equilibrium constants having the following values: $K_{a1} = 7.6 \times 10^{-3}$, $K_{a2} = 6.2 \times 10^{-8}$, and $K_{a3} = 2.1 \times 10^{-13}$.

1. For a $\text{pH} = 7.4$, draw the Lewis structures (showing all bonds, all lone pairs, and all charges—not partial charges) for the two most concentrated forms of phosphoric acid. Clearly show which of the two forms is present at a greater concentration.
2. For the two forms drawn in part a, calculate the relative amounts that would be present at a $\text{pH} = 7.4$.
3. For a $\text{pH} = 1$, draw the complete Lewis structure of the most concentrated form of phosphoric acid.
4. For a pH of 13, draw the complete Lewis structure of the most concentrated form of phosphoric acid.