Exercise 1 — Basics about acids and intermolecular forces

1. Phosphoric acid (H$_3$PO$_4$) is a weak acid. Its dissociation constants are pK$_{a1}$ = 2.15, pK$_{a2}$ = 6.82, pK$_{a3}$ = 12.38. Draw a titration curve (“H$^+$ ions dissociated per molecule” along the x-axis, pH along the y-axis) from 0 to 3 H$^+$ ions dissociated.

2. In a solution at pH = 7.2, what would the predominant form of phosphoric acid be? What would be the next most common form?

3. What intermolecular force or forces hold(s) together molecules of palmitic acid CH$_3$(CH$_2$)$_{14}$COOH, a fatty acid?