
Show all work with units and correct significant figures.

1. A student draws methanol, CH_3OH , dissolved in water as separate CH_3^+ and OH^- ions. (a) Explain what is wrong with this drawing. (b) Name the main attraction between methanol and water molecules, and describe how to show it in a particle diagram.

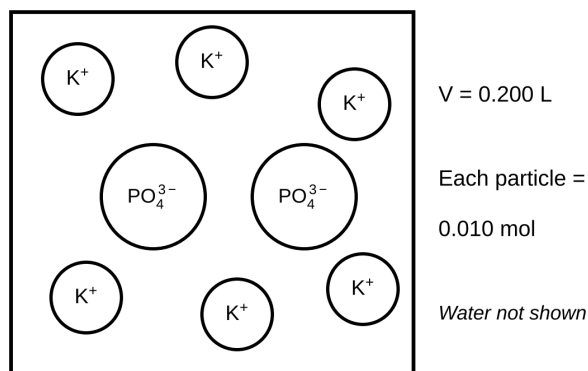
2. Draw a particle diagram of aqueous lithium sulfate that includes two sulfate ions. You may leave out the water molecules. Label each ion with its charge.



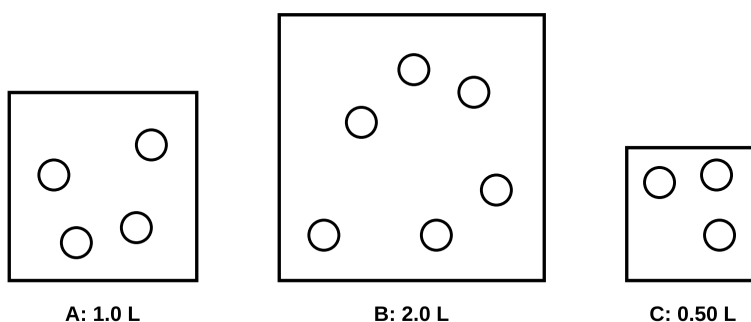
3. Around each ion below, draw four water molecules oriented correctly. On one water molecule for each ion, label the end that faces the ion as δ^+ or δ^- .



4. The box shows all of the ions in 0.200 L of a K_3PO_4 solution. (a) Calculate $[K^+]$. (b) Calculate the molarity of K_3PO_4 . (c) Explain why the diagram correctly shows more K^+ ions than PO_4^{3-} ions.



5. Each box holds the same solute dissolved in water. The volume of each box is given. Rank the samples from highest to lowest molarity, and explain your ranking.



6. Box A represents 50.0 mL of 0.60 M sucrose solution. Water is added until the total volume is 150.0 mL. (a) Calculate the new molarity. (b) Box B is the same size as Box A. Draw the number of sucrose molecules that belong in Box B.

