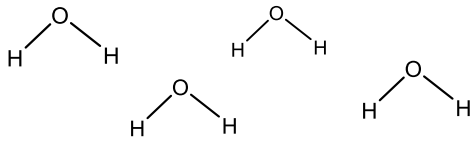


1) Answer the following questions about the substance, calcium chloride, CaCl_2 .

- a) What type of substance is CaCl_2 ? (**NPC, Slightly PC, PC, Very PC, Ionic**). Justify your decision. (*Hint: All NM's? $M+NM$? Full or partial charges?*)
- b) Predict the solubility of CaCl_2 solid in the following liquids. (Fill in soluble or insoluble.)

Hexane (nonpolar covalent)	Ethanol (slightly polar covalent)	ethylene glycol (polar covalent)	Water (very polar covalent)

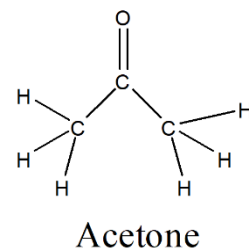
- c) Suppose that CaCl_2 solid is put into some water, shaken and allowed to settle. Draw before and after particle diagrams of what occurs. *You must show all full or partial charges and use dotted lines to show a few attractions between particles/molecules.*

Before Mixing	After Mixing
CaCl_2 (s)	
H_2O (l) 	

- d) Explain why CaCl_2 and water separate or mix as you have shown in your diagrams. *Your explanation should include the words- attracted and entropy.*

2) Answer the following questions about the substance, acetone.

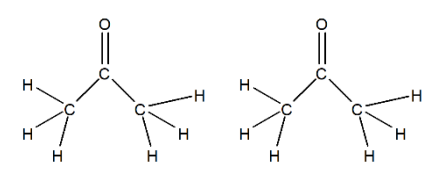
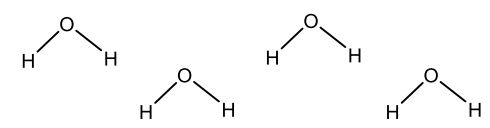
- a) Write in any partial charges into acetone's structure at the right. Based on acetone's structure, what type of substance is acetone? (**NPC, Slightly PC, PC, Very PC, Ionic**). Justify your decision. (*Hint: All NM's? $M+NM$? Full or partial charges? Lots of charges? Some charges?*)



- b) Predict the solubility of acetone in the following liquids. (Fill in soluble or insoluble.)

Hexane (nonpolar covalent)	Ethanol (slightly polar covalent)	ethylene glycol (polar covalent)	Water (very polar covalent)

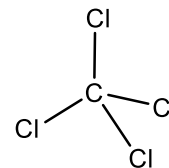
- c) Suppose liquid acetone is put into some water, shaken and allowed to settle. Draw before and after particle diagrams of what occurs. *You must show all full or partial charges and use dotted lines to show a few attractions between particles/molecules.*

Before Mixing	After Mixing
acetone(l) 	
H ₂ O (l) 	

- d) Explain why the molecules of acetone and water separate or mix as you have shown in your diagrams. *Your explanation should include the words- attracted and entropy.*

3) Answer the following questions about the substance, carbon tetrachloride, CCl₄.

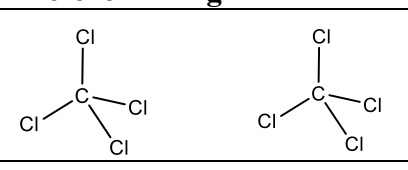
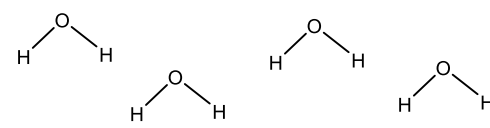
Write in any partial charges into carbon tetrachloride's structure at the right. Based on its structure, what type of substance is CCl₄? (**NPC, Slightly PC, PC, Very PC, Ionic**) **Justify your decision.** (*Hint: All NM's? M+NM? Full or partial charges?*)



- a) Predict the solubility of carbon tetrachloride in the following liquids. (Fill in soluble or insoluble.)

Hexane (nonpolar covalent)	Ethanol (slightly polar covalent)	ethylene glycol (polar covalent)	Water (very polar covalent)

- b) Suppose liquid carbon tetrachloride is put into some water, shaken and allowed to settle. Draw before and after particle diagrams of what occurs. *You must show all full or partial charges and use dotted lines to show a few attractions between particles/molecules.*

Before Mixing	After Mixing
carbon tetrachloride 	
H ₂ O (l) 	

- c) Explain why the molecules of carbon tetrachloride and water separate or mix as you have shown in your diagrams. *Your explanation should include the words- attracted and entropy.*