

Investigation 14.A: Comparing Organic and Inorganic Compounds Answer Key

Answers to Analysis Questions

1. You should identify inorganic compounds as: deionized water, sodium chloride crystals, sodium hydrogen carbonate, and calcium carbonate. Organic substances should be identified as: ethanoic acid, propanol, pentane, salicylic acid crystals, sucrose crystals, hexane or cyclohexane, naphthalene crystals, propylene glycol, and glycerol.
2. Ionic solids will be sodium chloride crystals, sodium hydrogen carbonate, and calcium carbonate. Molecular solids will be salicylic acid crystals, sucrose crystals, and naphthalene crystals. There are no ionic liquids in this investigation. Molecular liquids are deionized water, ethanoic acid, propanol, pentane, hexane or cyclohexane, propylene glycol, and glycerol.
3. No. You will find that several solvent-solute combinations contradict this statement.
4. Yes. In general, you will find this to be true. However, the rate of dissolution might lead you to incorrectly conclude that a solute will not dissolve.
5. Answers will vary depending on your results. However, you should observe that ethanoic acid and salicylic acid, which are both molecular substances, do conduct electricity to some extent.
6. You should note that as the number of carbon–oxygen polar covalent bonds increases, the viscosity also increases. The presence of more polar bonds for a compound will result in greater intermolecular forces of attraction, leading to a greater viscosity.

Answer to Conclusion Question

7. Your answer will depend on the quality of your observations and the nature of your hypothesis. You should conclude that solubility and viscosity depend on the presence and abundance of polar bonds in a compound. In general, as the non-polar region of a molecule increases in size relative to the polar region, the solubility of a substance in water will decrease.