**NAME: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

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| **Dissolving process** | Dissolving requires…   * solute-solute forces to be broken * solvent-solvent forces to be broken * new attraction to form between solute and solvent | 2 |  |
| Substances only dissolve if new forces of attraction are similar in strength or stronger than the forces of attraction that are broken. | 2 |  |
| **Solvent-solvent interactions** | The predominant IMF in water is hydrogen bonding | 1 |  |
| The predominant IMF in hexane is dispersion forces | 1 |  |
| **Hydrocarbons** | There are dispersion forces between decane molecules | 1 |  |
| Water forms dispersion forces with decane. These are weaker than the hydrogen bonds in water, therefore decane is insoluble | 1 |  |
| Hexane forms dispersion forces with decane. These are similar in strength to the dispersion forces within each individual substance. Therefore decane is soluble in hexane. | 1 |  |
| **Alcohols** | Water can form hydrogen bonds with methanol and pentanol | 1 |  |
| Hexane can form dispersion forces with methanol and pentanol | 1 |  |
| Solubility in water decreases with increasing chain length. Only a small portion of pentanol molecule can form hydrogen bonds. Most of molecule cannot form H bonds with water. | 1 |  |
| Solubility in hexane increases with increasing chain length. As the length of the chain increases a greater proportion of the molecule is able to form dispersion forces with hexane. | 1 |  |
| **Allose** | Hydrogen bonds in pure allose | 1 |  |
| Forms hydrogen bonds with water. This is similar in strength to H bonds in solute and H bonds in solvent | 1 |  |
| Forms dispersion forces with hexane. This is weaker than H bonds in solute. | 1 |  |
| **Ionic solutes** | Ionic bonding in NaCℓ and AgCℓ | 1 |  |
| NaCℓ forms strong ion-dipole forces with water, which overcome strength of ionic bonds | 1 |  |
| AgCℓ does not dissolve in water. Therefore ionic bonding in AgCℓ must be stronger than ion-dipole forces that would form | 1 |  |
| Ionic substances are not soluble in hexane. It is a non-polar solvent so cannot form ion-dipole forces / could only form weak dispersion forces | 1 |  |
| **Quality of writing** | Characteristics of excellent answer:  - Well organized ideas that flow easily  - Excellent use of vocabulary, including relevant scientific terms  - Use of subheadings and paragraphs to effectively order ideas  - Concise language – lack of needless repetition  - Use of labelled diagrams and/or tables where appropriate  - Legible writing with minimal spelling errors | 2.5 |  |

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| **Total Score** | | |
| Q1 (/22.5) | |  |
| Q2 (/22.5) | |  |
| Penalties for incomplete or late drafts  *(max -2 per question)* | Q1 |  |
| Q2 |  |
| Q3 |  |
| Q4 |  |
| **OVERALL (/45)** | |  |