

Lab Instructor: \_\_\_\_\_

Name: \_\_\_\_\_

**DATA – Part 1**

| Substance                         | Soluble or insoluble in: |             | Is the substance polar or nonpolar? |
|-----------------------------------|--------------------------|-------------|-------------------------------------|
|                                   | Water                    | Cyclohexane |                                     |
| 100% ethanol                      |                          |             |                                     |
| Moth repellent (naphthalene)      |                          |             |                                     |
| NaCl                              |                          |             |                                     |
| KI                                |                          |             |                                     |
| BaSO <sub>4</sub>                 |                          |             |                                     |
| Sucrose                           |                          |             |                                     |
| Vegetable oil                     |                          |             |                                     |
| Water                             | omit                     |             |                                     |
| Baking soda (NaHCO <sub>3</sub> ) |                          |             |                                     |
| Paraffin wax                      |                          |             |                                     |
| Heptane                           |                          |             |                                     |
| Acetic acid                       |                          |             |                                     |
| Butter                            |                          |             |                                     |

**DATA – Part 2**

| Substance  | Condensed structural formula | # of drops that dissolve in 2 mL water |
|------------|------------------------------|--|
| Methanol   |                              |  |
| 1-Propanol |                              |  |
| 1-Pentanol |                              |  |
| 1-Butanol  |                              |  |
| 1-Hexanol  |                              |  |

### DATA – Part 3

| Substance | Soluble or insoluble in: |             | Is the substance polar or nonpolar? |
|-----------|--------------------------|-------------|-------------------------------------|
|           | Water                    | Cyclohexane |                                     |
| Vitamin C |                          |             |                                     |
| Vitamin E |                          |             |                                     |
| Vitamin A |                          |             |                                     |
| Vitamin B |                          |             |                                     |

#### Questions

1. Look at your data for part 2 of this experiment. How does the solubility of an alcohol in water relate to the “chain length” of that alcohol?
2. Imagine you did an experiment in which you tested the solubility of various alcohols in cyclohexane (instead of in water). Which alcohol (of the ones you tested in part 2) would you expect to be the most soluble in cyclohexane? Which would be least soluble in cyclohexane? Explain your reasoning clearly.
3. How do the structures of the “fat-soluble” and the “water-soluble” vitamins differ?

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