Grossmont College Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Chemistry 102, Spring 2017

Quiz (28 points) Date: \_\_\_\_\_\_\_\_\_\_\_\_

1. (2 points) Which of the following will have the largest vapor pressure at a given temperature?

a. CCl4 b. CH2Cl2 c. CH3Cl d. CH3OH e. CH3CH2OH

1. (4 points) List **all the intermolecular attractive forces** (ion-dipole, London, dipole-dipole, hydrogen bonding**)** in each of the following:

NH3 in water \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Benzene, C6H6 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. (4 points) Which substance is able to form hydrogen bonds? CH3CH2OH or CH3OCH3? Draw a picture showing the hydrogen bonding interactions.
2. (10 points) Complete the following reaction by providing the products. Make sure the equation is balanced.
3. Draw a triacylglyceride where the three fatty acid portions are oleates (C18:1. Δ9) and then react it with the proper number of sodium hydroxide for complete base hydrolysis (draw product)

glycerol



1. The triglyceride reactant above is a liquid at room temperature. Is it considered a fat or an oil? \_\_\_\_\_\_\_\_\_\_\_\_

Why?

1. Explain briefly why soap makes a good cleanser.
2. (4 points) An ammonia sample at 65.5oC and 524 torr has a volume of 15.3 L. What is the volume when the temperature is -15.8oC at the same pressure?
3. (4 points) Using the terms miscible, immiscible, soluble, insoluble, predict the solubility outcome of each set of solute and solvent

The liquid ethanol (CH3CH2OH) in water \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

The ionic solid sodium bromide (NaBr) in water \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

The liquid ethanol (CH3CH2OH) in oil (ex: CH3(CH2)22CH3) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

The ionic solid Sr(OH)2 in oil \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Solubility Rules for Ionic Compounds**

Compounds containing the following ions are generally *soluble* in water:

1. Alkali metal ions and ammonium ion
2. Acetate ion

### Nitrate ion

### Halide ions (X) (AgX, Hg2X2, and PbX2 are insoluble exceptions)

### Sulfate ion (SrSO4, BaSO4, and PbSO4, are insoluble exceptions)

### Compounds containing the following ions are generally *insoluble* in water:

### Carbonate ion (see rule 1 exceptions, which are soluble)

### Chromate ion (see rule 1 exceptions, which are soluble)

### Phosphate ion (see rule 1 exceptions, which are soluble)

### Sulfide ion (CaS, SrS, BaS, and rule 1 exceptions are soluble)

### Hydroxide ion [Ca(OH)2, Sr(OH)2, Ba(OH)2, and rule 1 exceptions are soluble]