

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

Lab Section: 1(TuTh@1) 2(TuTh@9)

CHM 102  
20 points, 30 mins.

Winter 2008  
week 8

**Basic Competency Quiz #5 KEY**  
*Chemistry, 7<sup>th</sup> ed., Zumdahl & Zumdahl, sections 10.1-10.8*

Wallace

revised 2/29/2008

*Unless otherwise specified, each question is worth 5 points.*

VERSION A

- Identify the most important types of interparticle forces present in the liquids or solids of each of the following substances. (*Choose from the following: covalent bonds, ionic bonds, hydrogen bonding, dipole-dipole forces, or London Dispersion Forces.*)
  - Ar ..... **LONDON DISPERSION FORCES**
  - HCl..... **DIPOLE-DIPOLE**
  - CH<sub>3</sub>OH ..... **HYDROGEN BONDING**
  - MgO..... **IONIC BONDS or ION-ION**
  - SiO<sub>2</sub> ..... **COVALENT BONDS (network solid)**
- Predict which substance in each of the following pairs would have the greater (stronger) interparticle forces. (*Circle your choice from each pair.*)
  - CO<sub>2</sub> or **OCS**
  - SO<sub>2</sub>** or SF<sub>6</sub>
  - CH<sub>3</sub>CH<sub>2</sub>CH<sub>2</sub>CH<sub>2</sub>NH<sub>2</sub> or **H<sub>2</sub>NCH<sub>2</sub>CH<sub>2</sub>CH<sub>2</sub>NH<sub>2</sub>**
  - H<sub>2</sub>CO** or CH<sub>3</sub>CH<sub>3</sub>
  - H<sub>2</sub>CO or **CH<sub>3</sub>OH**
- In each of the following groups of substances, pick (*circle*) the one that has the given property.
  - highest boiling point: CH<sub>4</sub>, CH<sub>3</sub>CH<sub>3</sub>, **CH<sub>3</sub>CH<sub>2</sub>CH<sub>2</sub>CH<sub>3</sub>**
  - highest melting point: ~~NaCl, Cl<sub>2</sub>, OCl<sub>2</sub>~~ (*there was a typo in this question*)
  - highest vapor pressure: **H<sub>2</sub>Se, H<sub>2</sub>S**, H<sub>2</sub>O
  - greatest viscosity **CO**, CH<sub>4</sub>, O<sub>2</sub>
  - highest heat of fusion: Cl<sub>2</sub>, O<sub>2</sub>, SiCl<sub>4</sub>, **SiO<sub>2</sub>**

Unless otherwise specified, each question is worth 5 points.

VERSION B

1. Identify the most important types of interparticle forces present in the liquids or solids of each of the following substances. (*Choose from the following: covalent bonds, ionic bonds, hydrogen bonding, dipole-dipole forces, or London Dispersion Forces.*)

- a. HCl..... **DIPOLE-DIPOLE**
- b. Ar ..... **LONDON DISPERSION FORCES**
- c. CH<sub>3</sub>OH ..... **HYDROGEN BONDING**
- d. SiO<sub>2</sub> ..... **COVALENT BONDS (network solid)**
- e. MgO..... **IONIC BONDS or ION-ION**

2. Predict which substance in each of the following pairs would have the greater (stronger) interparticle forces. (*Circle your choice from each pair.*)

- a. **OCS** or CO<sub>2</sub>
- b. SF<sub>6</sub> or **SO<sub>2</sub>**
- c. **H<sub>2</sub>NCH<sub>2</sub>CH<sub>2</sub>CH<sub>2</sub>NH<sub>2</sub>** or CH<sub>3</sub>CH<sub>2</sub>CH<sub>2</sub>CH<sub>2</sub>NH<sub>2</sub>
- d. CH<sub>3</sub>CH<sub>3</sub> or **H<sub>2</sub>CO**
- e. **CH<sub>3</sub>OH** or H<sub>2</sub>CO

3. In each of the following groups of substances, pick (*circle*) the one that has the given property.

- a. highest boiling point: **CH<sub>3</sub>CH<sub>2</sub>CH<sub>2</sub>CH<sub>3</sub>**, CH<sub>3</sub>CH<sub>3</sub>, CH<sub>4</sub>
- b. highest melting point: ~~OCl<sub>2</sub>, Cl<sub>2</sub>, NaCl~~ (*there was a typo in this question*)
- c. highest vapor pressure: H<sub>2</sub>O, **H<sub>2</sub>S, H<sub>2</sub>Se**
- d. greatest viscosity CH<sub>4</sub>, O<sub>2</sub>, **CO**
- e. highest heat of fusion: O<sub>2</sub>, Cl<sub>2</sub>, **SiO<sub>2</sub>**, SiCl<sub>4</sub>

