CHM 1020-01 **QUIZ 5** **February 19, 1999**

This quiz is take-home and open book, and it is intended that all members of the group contribute to completing it. It is a violation of the Academic Honor Code to sign a quiz that you did not work on. **The quiz is due at the end of class on Thursday, February 25.**

List names in alphabetical order, and give social security numbers! Put names on all pages, and stapel pages together

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Points

(3) 1. You remove 255 grams of ice cubes from your freezer which is at a temperature of -5°C. What would be the heat energy required to convert this ice into water at 90°C (the temperature recommended for brewing a "perfect" cup of coffee). Express your answer both in **calories** and in **joules.**

(3) 2. Following are the specific heats of three metals:

Al (0.90 J/g-°C) Fe (0.45 J/g-°C) Hg (0.14 J/g-°C)

For each element, calculate the final temperature if you add 100 J of heat energy to a 15 gram sample of the element.

List names in alphabetical order**.** **<u>Be sure to staple pages together</u>!**

(9) 3. Draw structural formulas for each of the following, representing the three dimensional geometry as best you can. For each covalent bond in each molecule, give the **electronegativity difference** between the atoms in the bond and draw an arrow indicating the **polarity** of the bond (with the arrow head pointing to the more electronegative atom).

From the polarity of the individual bonds and the geometry of the molecule, indicate whether the molecule will be **polar** or **non-polar**.

(a) NH_3 (b) BF_3

(c) SO_2 (d) CO_2

(e) CCl_4 (f) $CHCl_3$