

CHM1032 Study Guide for Exam 1 (Chapters 1 & 2)

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This may NOT be a complete list of what will be on the Test. You must also study class notes, the homework, and the textbook. This is just a study guide to help you.

1. Be able to identify units of length, volume, mass, density, and temperature.
2. Be able to write numbers in scientific notation and in decimal form.
3. Be able to identify measured numbers versus exact numbers. (see textbook).
4. Be able to identify how many significant figures are in a number, and the least significant place (LSP).
5. Be able to follow significant figure rules when doing calculations, including rounding correctly.
6. Know all metric prefixes in table 1.8 in your textbook (p. 21): know the names, the correct abbreviation, and the conversion factor. For example, mm = millimeter, 1000mm = 1m. Or, nm = nanometer, 1 nm = 1×10^{-9} m.
7. Be able to write unit conversion factors and use to convert units.
8. Be able to convert one unit to another. See examples from class, your online homework, and the textbook.
9. Know the following conversions, any others that you may need I will give you.
 - 1 inch = 2.54 cm (an exact number)
 - 1 mL = 1 cm³
 - 12 inch = 1 foot
 - 3 feet = 1 yard
 - 1 hour = 60 minutes
 - 1 minute = 60 seconds
 - 1 day = 24 hours
 - All metric conversions in Table 1.8 (p. 21)
10. Be able to convert units that are squared (area) or cubed (volume), for example, ft³ to mm³.
11. Know definition and equation for density, density = mass/volume, and be able to solve and calculate the density, mass or volume, depending on which information is given in the problem.
12. Know definition and equation for specific gravity and be able to do calculations using this. See examples from class, online HW, and textbook.
13. Calculate the number of calories in a sample of food given the number of grams of carbohydrate, protein, and/or fat.
14. Be able to convert temperatures into degrees Celsius, degrees Fahrenheit, and Kelvin.
15. Be able to calculate the amount of heat added or lost when there is a temperature change, using: heat (added or lost) = (specific heat)(mass)(temperature change)
16. Given several materials, be able to identify which material will reach the highest or lowest temperature if the same amount of heat is added, and the initial temperature is the same.

17. Be able to calculate the amount of heat added or lost when converting between a liquid and solid, using the Heat of Fusion: $\text{heat (lost or gained)} = (\text{heat of fusion})(\text{mass})$.
18. Be able to calculate the amount of heat added or lost when converting between a liquid and gas, using the Heat of Vaporization:
 $\text{heat (lost or gained)} = (\text{heat of vaporization})(\text{mass})$.
19. Know the chemical symbols and English names of elements #1-38, 47, 48, 50, 53-56, 78-80, 82, 86-88, and 92. These will most likely be fill-in-the-blanks.
20. Be able to describe the Scientific Method (p. 4-5).

Know definitions and identify examples of:

density, specific gravity, work, energy, potential energy, kinetic energy, heat, Joule = J, calorie = cal, Calorie = Cal (food), 1Cal=1000cal=1kcal, calorimeter, specific heat, temperature change, states of matter (=physical states), solid, liquid, gas, changes of state, melting point, freezing point, fusion, heat of fusion, sublimation, deposition, evaporation, boiling, condensation, boiling point, heat of vaporization, vaporization, heating curve, cooling curve, caloric content....

Given on the exam (if you need):

1 cal = 4.184 J (exact) 1 mile = 5280 feet (exact)

Protein has 4 kcal/g fat has 9 kcal/g carbohydrate has 4 kcal/g

Heat of Fusion of water = 80.cal/g

Heat of Vaporization of water = 540 cal/g

I may also give you Heat of Fusion or Heat of Vaporization for materials other than water. (You use them the same way.)

Specific Heat of water = 1.00 cal/g°C. I may also give you specific heats of other materials.