

JF General Chemistry Tutorial Sheet 1

1. A chemist investigates the boiling point, melting point and flammability of a compound called acetone, a component of fingernail polish remover. Which of these properties are physical properties and which are chemical properties?
2. Express the following measurements in Scientific Notation.
 - (a) 0.000000001 g
 - (b) 1/100000000 m
 - (c) 0.000000535 m
3. Perform the following calculations and round the answers to the correct number of significant figures (units are omitted for clarity)
 - (a) $(2.568 \times 5.8)/4.186$
 - (b) $5.41 - 0.398$
 - (c) $3.38 - 3.01$
 - (d) $4.18 - 58.1 \times (3.38 - 3.01)$
4. How many valence electrons does a nitrogen atom (N) have?
5. What anion is bromine, Br, likely to form? How many electrons will the anion possess? What cation is Mg likely to form?
6. What kind of chemical bonds do you know? Explain their main characteristics.
7. Aspartame $C_{14}H_{15}N_2O_5$ is an artificial sweetener. Calculate
 - (a) How many molecules are present in 1.0 mg of aspartame
 - (b) The mass percentage composition of aspartame.

8. Write the formulae of
- (a) a cupric ion
 - (b) a chloride ion
 - (c) calcium phosphate
 - (d) aluminium sulfate
 - (e) sodium hydrogen carbonate
 - (f) copper(II)perchlorate hexahydrate
9. On the basis of the classification of the elements, decide which of the following are expected to be ionic and which are expected to be molecular
- (a) LiCl
 - (b) SCl₄
 - (c) SbF₃
10. Give the number of protons, neutrons and electrons in an atom of
- (a) tritium ³H
 - (b) ⁶⁰Co
 - (c) oxygen-16
 - (d) ²⁰⁴Pb