

Sample practice problems of Midterm level from Chapter 1 and 2 (Answers in the end)

- 1.3 The number of significant figures for the mass measured as 0.0600 ± 0.0004 g is
- 1.7 The number of significant figures in 0.074100×10^{-4} is
- 1.9 The distance between atoms is sometimes given in picometers, where 1 pm is equivalent to 1×10^{-12} m. If the distance between the carbon atoms in diamond is 1.54×10^{-8} cm, what is this distance in picometers?
- 1.10 What is the best way to report the answer to the following expression?
(12.125 + 0.530 + 71.4)
- 1.19 What is the correct answer to the following expression?
 $3.54 \times 10^{-10} + 2.68 \times 10^{-12}$
- 1.22 Three different samples were weighed using a different type of balance for each sample. The three were found to weigh 0.1568934 kg, 1.215 mg, and 2458.1 g. The total mass of the samples reported in grams should be reported as
- 1.36 Order the four metric units from smallest to largest.(from memory!!!)
1) kilometer 2) centimeter 3) micrometer 4) millimeter
- 1.44 The heat of combustion of benzoic acid is -26.4 kJ/g. What is the heat of combustion expressed in joules per kilogram?
- 1.48 (HARDER one!)How many scruples are there in 25.8 lb? Write up a correct setup to solve the problem. Some equivalents that may be helpful are given below:
1.00 scruple = 20.0 grains
1.00 g = 15.4 grains
1.00 grain = 0.0648 g
1.00 lb = 453.6 g
1.00 kg = 2.205 lb
- 1.54 In 1928, 1.0 g of rhenium, Re, was isolated from 660 kg of the ore molybenite. The percent by mass of this element in the molybenite was
- 1.59 A 0.375 kg sample of methylene chloride has a density of 1.326 g/cm³. Calculate its volume.
e. 497 cm³
- 1.62 A sheet of Xerox paper measures 8.5×11.0 inches. What is the surface area of one side of the paper in cm²?
- 1.66 An irregularly shaped metal was weighed by the following difference:
Watch glass + metal = 56.7813 g
Watch glass = 35.4725 g

The volume of the metal was determined by placing the metal in a graduated cylinder that had water in it and measuring the volume difference.

$$\begin{aligned}\text{Graduated cylinder + water + metal} &= 14.15 \text{ mL} \\ \text{Graduated cylinder + water} &= 11.25 \text{ mL}\end{aligned}$$

The density should be reported as

- 1.74 All of the following statements are correct **EXCEPT**
- The conversion of compounds into elements is a chemical change.
 - The conversion of sugar to carbon and water is a chemical change.
 - The conversion of elements into compounds is a chemical change.
 - The conversion of liquid water to gaseous water is a chemical change.
 - The evaporation of water is a physical change.
- 1.89 (It is easier than you might think! ☺) Four cubes of equal mass are made of lead (density = 11.3 g/cm^3), silver (10.5 g/cm^3), iron (7.90 g/cm^3), and aluminum (2.70 g/cm^3). Which metal cube has the longest edge? (Section 1.7)
- 2.2 The number of protons in a given nucleus determines the
- number of electrons in the nucleus.
 - atomic number.
 - mass number.
 - number of isotopes .
 - all of the above.
- 2.4 The following species, $_{15}\text{P}^{3-}$, $_{17}\text{Cl}^-$, and $_{20}\text{Ca}^{2+}$, all have the same number of
- protons.
 - electrons.
 - neutrons.
 - isotopes.
 - nucleons.
- 2.9 What is the symbol of the ion having 13 protons and 10 electrons?
- 2.15 Which combination of protons, neutrons and electrons represents a $^{57}\text{Fe}^{3+}$ ion?
- 2.23 There are three isotopes of carbon differing with respect to
- number of neutrons.
 - atomic number.
 - nuclear charge.
 - electron configuration.
 - number of protons.
- 2.27 The total number of atoms in one formula unit of $(\text{C}_2\text{H}_5)_4\text{NClO}_4$ is
- 2.34 A series of silicon–hydrogen compounds with the general formula $\text{Si}_n\text{H}_{2n+2}$ can be represented by the known compounds SiH_4 , Si_2H_6 , and Si_3H_8 . Which law is best illustrated in this molecular formula sequence?
- 2.38 What is the symbol for the element phosphorus?
- K
 - P
 - Pr
 - Po
 - Pt

- 2.40 Which **ONE** of the following lists gives the correct symbols for the elements potassium, magnesium, beryllium, and sodium in that order?
- P, Mn, Be, Se
 - Po, Mn, Br, Na
 - Pt, Mg, Be, Sc
 - K, Mn, Br, Na
 - K, Mg, Be, Na
- 2.52 The species that is formed when a molecule gains an electron is called
- an anion.
 - a cation.
 - an isotope.
 - a charge mass ratio.
 - an isomer.
- 2.53 The systematic name for BaH_2 is
- barium dihydrogen.
 - barium dihydride.
 - barium(II) hydrate.
 - barium dihydrate.
 - *e. barium hydride.
- 2.59 The formula for aluminum iodide is
- 2.72 The elements in a row of the periodic table are known as
- a family.
 - a group.
 - metals.
 - metalloids.
 - a period.
- 2.74 The group(s) that readily form cations is (are) the
- alkali elements.
 - halogen elements.
 - transition elements.
- 1 only
 - 2 only
 - 3 only
 - 1 and 2 only
 - 1 and 3 only

ANSWERS to Sample practice problems for Midterm 1 – Chapter 1 and 2

- 1.3 3.
1.7 5.
1.9 154
1.10 84.1
1.19 3.57×10^{-10}
1.22 2615.0 g.
1.36 $3 < 4 < 2 < 1$
1.44 -2.64×10^7 J/kg
1.48 $\frac{1.00 \text{ scruple}}{20.0 \text{ grains}} \times \frac{1.54 \text{ grains}}{1.00 \text{ g}} \times \frac{453.6 \text{ g}}{1.00 \text{ lb}} \times 25.8 \text{ lb}$
1.54 $1.5 \times 10^{-4}\%$.
1.59 283 cm^3
1.62 $6.0 \times 10^2 \text{ cm}^2$
1.66 7.35 g/mL .
1.74 *d. The conversion of liquid water to gaseous water is a chemical change.
1.89 aluminum
2.2 *b. atomic number.
2.4 electrons.
2.9 Al^{3+}
2.15 26p, 31n, 23e
2.23 *a. number of neutrons.
2.27 34.
2.34 multiple proportions.
2.38 P
2.40 *e. K, Mg, Be, Na
2.52 *a. an anion.

2.53 barium hydride.
2.59 AlI_3 .
2.72 *e. a period.
2.74 *e. 1 and 3 only