

# Regular Chemistry Midterm Review

## Chapters 1, 2, 3, 4, 5, 6, and 21

### Vocabulary

Matter	Volume	Density	Chemical property	Physical property
Precision	Accuracy	Atom	Pure substance	Law of conservation of mass
Chemical change	Physical change	Homogeneous mixture	Heterogeneous mixture	Atomic number
Mass number	Compound	Molecule	Electron	Proton
Octet rule	element		Isotope	Orbital
Nonpolar covalent bond	Polar covalent bond	Ion	Atomic mass	Valence electron
Ionic bond	Alpha decay	Beta decay	Electron capture	Half life
Nuclear fission	Nuclide			

### Practice Questions

- What is the SI base unit for length, temperature, and mass?
- Know the metric system: Using conversion factors, solve for the following
  - 25 g \_\_\_\_\_ kg
  - 8 km = \_\_\_\_\_ cm
  - 0.0087 dag = \_\_\_\_\_ g
  - 345 ml = \_\_\_\_\_ L
- TEXTBOOK, page 42, #3 and page 59, #18
- What is the difference between a quantitative and a qualitative measurement?
- How is 25000 written in scientific notation? 0.0067?
- The density of an object is  $9.67 \text{ g/cm}^3$ . What is the volume of the object if the mass is 8.77 g?
- To three significant figures, the measurement 0.02507 g should be reported as \_\_\_\_\_.
- How many sig figs the following measurements have: 56.0 g, 0.0004 m, 1003 ml, 0.0350 s
- Identify the largest and smallest number from the following:  $4.86 \times 10^{-5}$ ,  $288 \times 10^{-6}$ ,  $18 \times 10^{-4}$ ,  $62.0 \times 10^{-8}$ ,  $9.4 \times 10^{-4}$
- Temperature conversions:  $423 \text{ K} = \text{_____}^\circ \text{C}$  ,  $28.5^\circ \text{C} = \text{_____} \text{ K}$

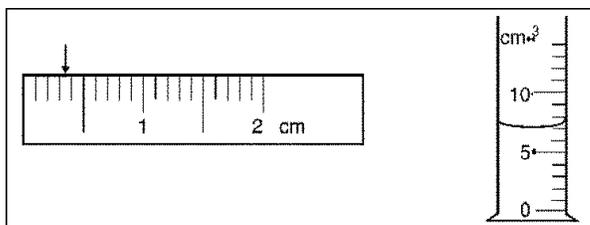


Figure 1

- In Figure 1, how should the volume indicated in the graduated cylinder be recorded?
- TEXTBOOK: page 14, #1 & 2 and page 22, # 9 & 12.
- TEXTBOOK: page 57, #5, 7, and page 67, #36
- How is the identity of an element is determined?
- Fill in the table

Symbol	Atomic No.	# of protons	# of neutrons	# of electrons	Mass No.
	9		10		
			7		14

- What do  $^{40}\text{Ca}$ ,  $^{39}\text{K}$ , and  $^{41}\text{Sc}$  have in common?
- TEXTBOOK: page 76, #3, page 87, #2 & 3,
- TEXTBOOK: page 122, #3 & 5 and page 125, #37
- $1s^2 2s^2 2p^6 3s^2 3p^6 4s^2 3d^{10}$  is the electronic configuration of which element?
- What is the maximum number of electrons that could be held by the *s*, *p* and *d* sublevels?
- Which scientist is credited with the first periodic table of elements?
- How many groups are in the periodic table? Periods?
- TEXTBOOK: page 166, #5, & 19
- Are element with similar chemical and physical properties more likely to be found in the same group or in the same period? Explain your answer.
- What periodic trends exist for atomic size, ionization energy and for electronegativity?
- How does the reactivity of elements changes throughout the periodic table?
- How do metals become ions? Nonmetals?
- An element that has an electron configuration of  $[\text{He}]2s^2 2p^1$  is in group \_\_\_\_\_ and period \_\_\_\_\_ of the periodic table.
- Classify the following as metal, nonmetal or metalloid: Si, Mg, Fe, O, Sb, Li, and C29. Which of the following ions do not have an octet of electrons:  $\text{N}^{2-}$ ,  $\text{Al}^{3+}$ ,  $\text{Cl}^-$ ,  $\text{Mg}^{3+}$ ,  $\text{O}^{2-}$
- Draw the Lewis dot diagram for Cl, Sr, and C
- How many electrons are shared in a single, double and triple bond?
- Classify the following compounds as ionic or molecular:  $\text{Cs}_2\text{O}$ ,  $\text{O}_2$ ,  $\text{CaSO}_4$ ,  $\text{H}_2\text{O}$ , and  $\text{NH}_3$
- TEXTBOOK: page 167, #28 & 29
- TEXTBOOK: page 177, #1-4, and page 189, #2 & 4
- TEXTBOOK: page 209, #13 & 19, and page 210, #25, 28 & 29
- The energy released in a nuclear reaction comes from \_\_\_\_\_.
- Which nuclear decay is most likely to occur if the nucleus of an atom is too large? If the ratio between neutrons and protons is too high? Ratio too low?
- $^{222}_{86}\text{Rn} \rightarrow \text{_____} + ^4_2\text{He}$ . Type of nuclear reaction: \_\_\_\_\_
- $^{14}_6\text{C} \rightarrow ^{14}_7\text{N} + \text{_____}$ . Type of nuclear reaction: \_\_\_\_\_
- $\text{_____} + ^1_0\text{n} \rightarrow ^{142}_{56}\text{Ba} + ^{91}_{36}\text{Kr} + 3^1_0\text{n}$
- Balance the following equation:  $^{226}_{88}\text{Ra} \rightarrow ^{226}_{88}\text{Rn} + \text{_____}$
- List nuclear radiation from least massive to most massive?
- TEXTBOOK: page 703, #12, 13 & 17
- The half-life of lead-212 is 11 h. How much of a 100-g sample of lead-212 is left after 44 h?
- What is the half-life of an isotope if 125 g of a 500 g sample of the isotope remains after 3.0 years?