

CHM 150/151 Exam 1 - Chapters 1, 2, 5, and 6**Show all work, report all units and clearly mark answers to receive credit!**

1) Write the formula for each compound.

a. Potassium nitride

b. Calcium oxide

2) Which of the following are chemical processes? Circle all that apply.

a. deposition of water

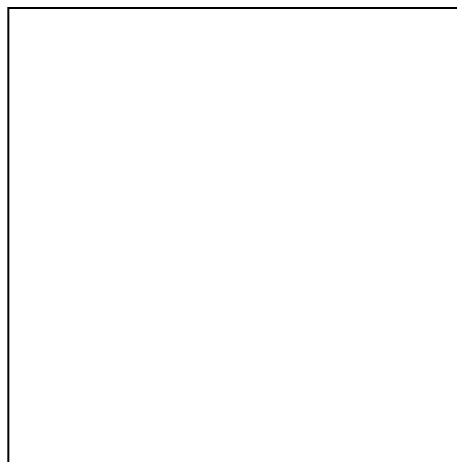
b. electrolysis of water

c. combustion of magnesium

d. photosynthesis

e. dissolution of sodium chloride

3) Pretend that you could see molecules and draw a representation of air in the box below. To the right of your picture, describe what air is in words, phrases and chemical symbols.



4) Circle the numbers below that are assumed to have 2 significant figures.

120

 1.30×10^{-3}

1.200

104

0.030

4.62

5) Complete the following conversion (SHOW ALL WORK):

a) $578 \text{ cm}^2 = \text{_____} \text{ in}^2$

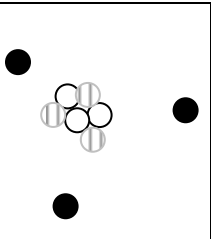
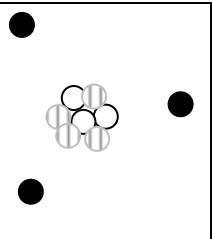
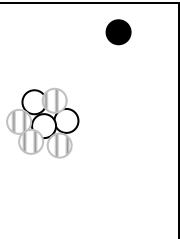
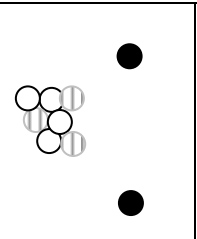
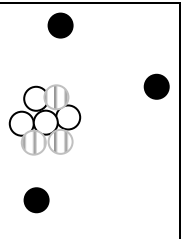
___ 6) The density of aluminum is 2.700 g/mL. What is the volume of 46.5g of aluminum?
Clearly show all work.

7) Below each box, write the identity of the depicted atom or ion using the notation

○ Proton

⊕ Neutron

● Electron

a. 	b. 	c. 	d. 	e. 
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8a) What did Thomson determine?

b) Who levitated oil drops to determine the charge of electrons?

c) Describe how Becquerel separated radioactive emissions into their components.

d) What are the specific identities of alpha, beta and gamma emissions?

$\alpha =$ _____

$\beta =$ _____

$\gamma =$ _____

Name: _____

Section: _____

9a) What is the energy of a mole of photons if each photon has a wavelength of $6.08 \times 10^{-7} \text{m}$?

9b) Draw an energy diagram of the first 4 energy levels of the H atom, with approximately correct spacing between energy levels.

Which absorption is of longest wavelength (circle the letter of your response)

- a. $n=2$ to $n=4$
- b. $n=1$ to $n=2$
- c. $n=4$ to $n=3$
- d. $n=4$ to $n=1$

Name: _____

Section: _____

11) Write electron configurations for atoms or ions of the following elements:

C (long hand): _____

Mg (long hand): _____

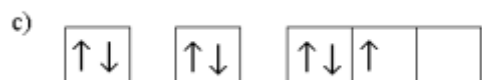
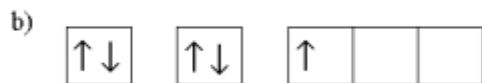
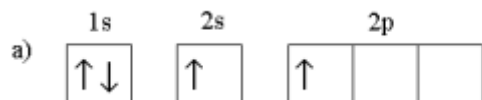
Cr (abbreviated): _____

Ti⁺ (abbreviated) _____Ca²⁺ (abbreviated): _____

12) Indicate the complete set of quantum numbers for the two lowest energy electrons in C

electron	n	l	m	s
1				
2				

13) Circle the letter for each diagram that represents an excited state. To the right of each diagram, identify the atom whose configuration is represented.



14a. Which is larger, K or Se? Explain.

b. Which is larger, Ca or Ca²⁺? Explain.

c. Write the chemical equation that corresponds to the ionization energy of fluorine.