

## Chemistry Final – Review

On the final, you will be able to use: your colored periodic table and a calculator. You will need a pen (blue or black) and a #2 pencil. The exam will be multiple choice and short answer.

Topics will include:

### **Scientific Notation/Significant Figures**

Be able to use your calculator for scientific notation problems. Convert to and from Scientific Notation. Be able to do all calculations using significant figures.

1.  $1.46 \times 10^7 =$
2.  $0.000\ 0045 =$
3.  $(2.37 \times 10^{15}) \times (3.4567 \times 10^{21}) =$
4.  $(1.34 \times 10^{-43}) \div (2.45 \times 10^{-13}) =$

### **Conversions**

Be able to do all metric conversions (K, -, c, m,  $\mu$ , n, p, f) for grams, meters and liters. Also be able to do unit conversions.

5.  $57\text{ km} = \underline{\hspace{2cm}}\text{ cm}$
6.  $0.004\ 56\text{ pg} = \underline{\hspace{2cm}}\text{ mg}$
7. Gas is \$2.25 per gallon. My Honda accord (11.5 gallon tank) gets 30.1 mpg. How far can I go on \$15.00?
8. Jon can swim 100 meters in 82 seconds. Assuming he can maintain that speed indefinitely, how long would it take him to swim a mile?

### **Atomic Models**

9. Dalton Model – Know the 5 proposals in his model and the two laws upon which the model is based
10. Thomson Model – Describe the model, know the experimental evidence that he used
11. Rutherford Model – Describe the model, know the experimental evidence
12. Bohr Model – Describe the model, know the experimental evidence
13. Quantum Mechanical Model – Know the four quantum numbers and what they represent

## Isotopes

Be able to calculate the average atomic weight given the weights of isotopes.

14. An element occurs in 3 naturally occurring isotopes, with weights of 90% it is 3.337 amu, 8% it is 4.448 amu and 2% it is 5.560 amu. What is the average atomic weight?

15. An element occurs in 5 naturally occurring isotopes: 70% it is 23.115 amu; 15% it is 24.227; 4% it is 25.339 amu and the rest of the time it is 24.341 amu. What is the average atomic weight?

## Charge and Mass

Be able to fill in the following type of chart:

Element & Isotope	Charge	Atomic #	# of Protons	# of Neutrons	# of Electrons	Mass #
${}^{16}_8\text{O}$	0					
	0	1		2		
${}^{31}_{15}\text{P}$	0					
	0	2		2		
${}^{35}_{17}\text{Cl}$	0					
${}^{35}_{17}\text{Cl}$	-1					
${}^{23}_{11}\text{Na}$	+1					

16. What is a cation? An anion?

17. Predict what type of ion the following would form: K, Mg, Al, P, Se, F, He

### ***Famous Dead Dudes***

Know what the following famous dead dudes are famous for:

18. Berzelius, Bohr, Dalton, Döbereiner, Einstein, Geiger, Helmholtz, Hund, Joule, Lavoisier, Lewis, Mendeleev, Millikan, Newlands, Planck, Proust, Rutherford, Thomson, Watt

### ***Lewis Dot Structures***

19. Make Lewis Dot structures for: Na, Al, P, Cl, Ar

20. Make Lewis Dot structures for the ions formed by: Mg, S, Sr, Xe, F

### ***Electron Configuration***

21. Write the electron configuration for Mg, V, La, Pm, W, Rn and U

22. Write the electron configuration for the ion formed by: F, Se, Sr, Ra

23. For the ions in N, tell whether they are isoelectronic with a noble gas. If so, which one?

### ***Nomenclature***

24. Give the formulas for the following:

Magnesium chloride

Scandium (II) nitride

Diphosphorus trioxide

Iron (II) phosphate

Hydrofluoric acid

Arsenous acid

Rubidium sulfite

Iron (III) chromate

Lithium dichromate

Chloric acid

Hydrochloric acid

Chlorous acid

25. Give the names for the following:

$K_2O$

HI (aq)

$Mo_3(Cr_2O_7)_3$

$Cs_3N$

$S_3O_7$

$Pd_2(NO_2)_3$

$H_2SO_4$  (aq)

$H_2SO_3$  (aq)

$H_2S$  (aq)

WS

$Ca(OH)_2$

$(NH_4)_3PO_4$

## **Chemical Reactions**

Be able to **translate** between English and chemical formulas:

26. Aqueous sodium hydroxide and phosphoric acid react to form aqueous sodium phosphate and water.



Be able to **balance** chemical reactions

