

## Grade 10 Exam Review #1 - Chemistry

Name: \_\_\_\_\_

Date: \_\_\_\_\_

I have compiled a list of questions in attempt to help you study for the final science exam. There is a very good chance that many of these questions will show up on the exam so it will only be beneficial to complete them.

1. What is the definition of chemistry?
2. What are subatomic particles?
3. Where do you find the atomic number and mass?
4. How can you determine what the number of protons, neutrons and electrons are in each element?
5. Copy and fill out the following table:

# of protons	# of electrons	# of neutrons	Atomic mass	Atomic number	Element Name	Element Symbol
7						N
				20		
			27			
		18			Chlorine	

6. What are the names of all the families we have learned about
7. Where are all the families located on the periodic table.
8. What are the rows called on a periodic table?
9. What are the columns called?
10. What is a valence shell?
11. How many electrons are found in the valence shells of the following elements:
  - a. Oxygen
  - b. Beryllium
  - c. Sodium
  - d. Krypton
12. What are metals and where are they found on the periodic table?
13. What are metalloids and where are they found on the periodic table?
14. What are non-metals and where are they found on the periodic table?
15. What does it mean for an element to be reactive?
16. What family is the most reactive and why?
17. What are stable octets?
18. What family is considered to be the most stable and why?
19. What is matter? What are the three states of matter?
20. What is the difference between elements and compounds?

21. Name 3 different compounds
22. What information does a Bohr model show?
23. Draw a bohr model for the following elements:
  - a. Aluminum
  - b. Potassium
  - c. Magnesium
  - d. Fluorine
24. What is an ion?
25. What is a cation?
26. What is an anion?
27. What does the term combining capacity mean?
28. What is the combining capacity of the following elements:
  - a. Boron
  - b. Calcium
  - c. Helium
  - d. Chlorine
29. Atoms that lose electrons will have what: a positive or negative charge?
30. What is an ionic compound?
31. Why do non-metals need to bond with metals?
32. What is an ionic bond?
33. Use a bohr model to show the ionic bond between Lithium and Fluorine.
34. What is the ionic compound formula for the following elements (**cross-over** method):
  - a. Calcium and Iodine
  - b. Aluminum and Chlorine
  - c. Magnesium and Phosphorus
  - d. Mg + F
  - e. Li + S
35. Draw the ion bohr diagram for the following ions:
  - a. Na<sup>+</sup>
  - b. S<sup>2-</sup>
  - c. Mg<sup>2+</sup>
36. Name the following ionic compounds
  - a. SrS
  - b. AlCl<sub>3</sub>
  - c. NaF
37. Put the following ionic compounds in their chemical formulas
  - a. Lithium Sulfide
  - b. Magnesium Oxide
  - c. Calcium Fluoride
38. What is the Stock Naming System?

39. How do you find the charge of the anion when dealing with multivalent metals?
40. Name the following ionic compounds using the stock system (this means they have multivalent metals in them and you must use roman numerals):
- $\text{PbS}_2$
  - $\text{TiCl}_3$
  - $\text{HgI}$
41. Given the name of the ionic compound, determine its chemical formula:
- Iron (III) chloride
  - Copper (I) bromide
  - Lead (IV) Sulfide
42. What is a multivalent metal?
43. What is a covalent/molecular bond?
44. What does the term diatomic mean and what are the 7 diatomic elements? (remember the acronym)
45. Name the following covalent/molecular compounds (remember to use prefixes!)

1	2	3	4	5	6	7	8	9	10
Mono	Di	Tri	Tetra	Penta	Hexa	Hepta	Octa	Nona	Deca

- $\text{CO}$
  - $\text{N}_2\text{O}$
  - $\text{CF}_4$
  - $\text{BCl}_3$
46. Write out the formulas of the following molecular compounds
- Nitrogen triiodide
  - Sulfur tetrabromide
  - Carbon tetrachloride
  - Dinitrogen pentoxide
47. What are polyatomic ions?
48. Using the table below, write out the correct formulas for the following polyatomic compounds.
- Aluminum hydroxide
  - Beryllium nitrate
  - Lead (IV) carbonate
  - Scandium phosphate

Name	Formula	Charge
ammonium	$\text{NH}_4^+$	+1
hydroxide	$\text{OH}^-$	-1
nitrate	$\text{NO}_3^-$	-1
nitrite	$\text{NO}_2^-$	-1
hypochlorite	$\text{ClO}^-$	-1
chlorite	$\text{ClO}_2^-$	-1
phosphate	$\text{PO}_4^{3-}$	-3
sulfate	$\text{SO}_4^{2-}$	-2

49. What is the law of conservation of mass
50. When balancing chemical equations, we use certain terms. What do the following terms mean:
- Word equation
  - Skeletal equation
  - Balanced chemical equation
51. For the following equation, identify the reactant, product and coefficients.
- a.  $2 \text{Ca} + \text{O}_2 \rightleftharpoons 2 \text{CaO}$
52. Balance the following skeletal equations:
- $\text{CH}_4 + \text{Cl}_2 \rightarrow \text{CCl}_4 + \text{HCl}$
  - $\text{Mg} + \text{N}_2 \rightarrow \text{Mg}_3\text{N}_2$
  - $\text{C}_3\text{H}_8 + \text{O}_2 \rightarrow \text{CO}_2 + \text{H}_2\text{O}$
  - $\text{Pb}(\text{NO}_3)_2 + \text{KI} \rightarrow \text{PbI}_2 + \text{KNO}_3$
53. Write out the formulas for the following compounds (you should know these my memorization):
- Ammonia
  - Water
  - Methane
  - Carbon dioxide
  - Hydrogen peroxide
54. Translate these formulas into word equations (remember to watch for multivalent metals, diatomic elements and molecular compounds!):
- $\text{Fe}_2\text{O}_3 + \text{H}_2 \rightarrow \text{Fe} + \text{H}_2\text{O}$
  - $\text{N}_2 + \text{O}_2 \rightarrow \text{N}_2\text{O}$
  - $\text{CH}_4 + \text{O}_2 \rightarrow \text{CO}_2 + \text{H}_2\text{O}$
  - $\text{C} + \text{H}_2\text{O} \rightarrow \text{CO} + \text{H}_2$
55. Translate the following word equations into formulas.
- Dinitrogen monosulfide breaks down to yield hydrogen gas and sulfur
  - Bromide gas and calcium iodide react to form iodine gas and calcium bromide.
  - Iron (III) sulfate and potassium hydroxide combine to form potassium sulfate.
  - Sulfur and oxygen gas combine to form sulfur dioxide.
56. What are the 5 major reaction types.
57. Identify the following formulas with their correct reaction type.
- $\text{H}_2 + \text{O}_2 \rightarrow \text{H}_2\text{O}$
  - $\text{HgO} \rightarrow \text{Hg} + \text{O}_2$
  - $\text{C}_3\text{H}_8 + \text{O}_2 \rightarrow \text{CO}_2 + \text{H}_2\text{O}$
  - $\text{Fe}_2(\text{SO}_4)_3 + \text{KOH} \rightarrow \text{K}_2\text{SO}_4 + \text{Fe}(\text{OH})_3$
  - $\text{H}_2\text{S} + \text{Cl}_2 \rightarrow \text{S}_8 + \text{HCl}$
58. What is the definition of an acid

59. What is the definition of a base?
60. What are indicators?
61. Is our stomach acidic or basic?
62. How does an alka selzer work in our stomachs?
63. What does pH stand for?
64. What numbers on the pH scale would indicate a neutral object? An acidic material? A basic material?
65. Describe the reactivity of acids and bases with metals.
66. Describe the conductivity of acids and bases.
67. What are the two products formed in a neutralizing reaction between an acid and a base?
68. Write a balanced formula for the following neutralizing reactions.
  - a. Hydrochloric acid and sodium hydroxide
  - b. Sulfuric acid and potassium hydroxide

1 1.0																		2 4.0																	
H hydrogen		IIA																VIIIA He helium																	
3	6.94	4	9.0																	5	10.8	6	12.0	7	14.0	8	16.0	9	19.0	10	20.2				
Li lithium	Be beryllium																	B boron	C carbon	N nitrogen	O oxygen	F fluorine	Ne neon												
11	23.0	12	24.3																	13	27.0	14	28.1	15	31.0	16	32.1	17	35.5	18	39.9				
Na sodium	Mg magnesium																	Al aluminum	Si silicon	P phosphorus	S sulfur	Cl chlorine	Ar argon												
		IIIB		IVB		VB		VIB		VIIB		VIIIB		IB		IIB		IIIA		IVA		VA		VIA		VIIA									
19	39.1	20	40.1	21	45.0	22	47.9	23	50.9	24	52.0	25	54.9	26	55.8	27	58.9	28	58.7	29	63.5	30	65.4	31	69.7	32	72.6	33	74.9	34	79.0	35	79.9	36	83.8
K potassium	Ca calcium	Sc scandium	Ti titanium	V vanadium	Cr chromium	Mn manganese	Fe iron	Co cobalt	Ni nickel	Cu copper	Zn zinc	Ga gallium	Ge germanium	As arsenic	Se selenium	Br bromine	Kr krypton																		
37	85.5	38	87.6	39	88.9	40	91.2	41	92.9	42	95.9	43	97.9	44	101.1	45	102.9	46	106.4	47	107.9	48	112.4	49	114.8	50	118.7	51	121.8	52	127.6	53	126.9	54	131.3
Rb rubidium	Sr strontium	Y yttrium	Zr zirconium	Nb niobium	Mo molybdenum	Tc technetium	Ru ruthenium	Rh rhodium	Pd palladium	Ag silver	Cd cadmium	In indium	Sn tin	Sb antimony	Te tellurium	I iodine	Xe xenon																		
55	132.9	56	137.3	71	175.0	72	178.5	73	180.6	74	183.9	75	186.2	76	190.2	77	192.2	78	195.1	79	197.0	80	200.6	81	204.4	82	207.2	83	209.0	84	209.0	85	210.0	86	222.0
Cs cesium	Ba barium	Lu lutetium	Hf hafnium	Ta tantalum	W tungsten	Re rhenium	Os osmium	Ir iridium	Pt platinum	Au gold	Hg mercury	Tl thallium	Pb lead	Bi bismuth	Po polonium	At astatine	Rn radon																		
87	223.0	88	226.0	103	260.1	104	261.1	105	262.1	106	263.1	107	264.1	108	265.1	109	268.0	110	269.0	111	272.0	112	277.0	113	114			116							
Fr francium	Ra radium	Lr lawrencium	Rf rutherfordium	Db dubnium	Sg seaborgium	Bh bohrium	Hs hassium	Mt meitnerium	Uun ununium	Uuu ununium	Uub ununbium	Uut ununtrium	Uuq ununquadium	Uuh																					

Rare Earth Elements

lanthanide series		actinide series																									
57	138.9	58	140.1	59	140.9	60	144.2	61	144.9	62	150.4	63	152.0	64	157.3	65	158.9	66	162.5	67	164.9	68	167.3	69	168.9	70	173.0
La lanthanum	Ce cerium	Pr praseodymium	Nd neodymium	Pm promethium	Sm samarium	Eu europium	Gd gadolinium	Tb terbium	Dy dysprosium	Ho holmium	Er erbium	Tm thulium	Yb ytterbium														
89	227.0	90	232.0	91	231.0	92	238.0	93	237.1	94	244.1	95	243.1	96	247.1	97	247.1	98	251.1	99	252.1	100	257.1	101	258.1	102	259.1
Ac actinium	Th thorium	Pa protactinium	U uranium	Np neptunium	Pu plutonium	Am americium	Cm curium	Bk berkelium	Cf californium	Es einsteinium	Fm fermium	Md mendelevium	No nobelium														