

Name _____

- 2) There are _____ electrons, _____ protons, and _____ neutrons in an atom of $^{132}_{54}\text{Xe}$.
- A) 132, 132, 54
 - B) 54, 54, 132
 - C) 78, 78, 54
 - D) 54, 54, 78
 - E) 78, 78, 132

3) Which pair of atoms constitutes a pair of isotopes of the same element?

- A) $^{14}_6\text{X}$ $^{14}_7\text{X}$
- B) $^{14}_6\text{X}$ $^{12}_6\text{X}$
- C) $^{17}_9\text{X}$ $^{17}_8\text{X}$
- D) $^{19}_{10}\text{X}$ $^{19}_9\text{X}$
- E) $^{20}_{10}\text{X}$ $^{21}_{11}\text{X}$

Periodic Table

14) Which pair of elements would you expect to exhibit the greatest similarity in their physical and chemical properties?

- A) O, S
- B) C, N
- C) K, Ca
- D) H, He
- E) Si, P

15) An element that appears in the lower left corner of the periodic table is _____.

- A) either a metal or metalloid
- B) definitely a metal
- C) either a metalloid or a non-metal
- D) definitely a non-metal
- E) definitely a metalloid

16) The elements in groups 1, 17, and 18 are called, _____, respectively.

- A) alkaline earth metals, halogens, and chalcogens
- B) alkali metals, chalcogens, and halogens
- C) alkali metals, halogens, and noble gases
- D) alkaline earth metals, transition metals, and halogens
- E) halogens, transition metals, and alkali metals

17) Which one of the following is most likely to lose electrons when forming an ion?

- A) F
- B) P
- C) Rh
- D) S
- E) N

18) When a metal and a nonmetal react, the _____ tends to lose electrons and the _____ tends to gain electrons.

- A) metal, metal
- B) nonmetal, nonmetal
- C) metal, nonmetal
- D) nonmetal, metal
- E) None of the above, these elements share electrons.

19) _____ typically form ions with a 2+ charge.

- A) Alkaline earth metals
- B) Halogens
- C) Chalcogens
- D) Alkali metals
- E) Transition metals

Chemical Names/Formulas

21) Which of the following compounds would you expect to be ionic?

- A) SF₆
- B) H₂O
- C) H₂O₂
- D) NH₃
- E) CaO

22) The charge on the iron ion in the salt Fe₂O₃ is _____.

- A) +1
- B) +2
- C) +3
- D) -5
- E) -6

23) What is the formula of the compound formed between strontium ions and nitrogen ions?

- A) SrN
- B) Sr₃N₂
- C) Sr₂N₃
- D) SrN₂
- E) SrN₃

24) Which species below is the nitride ion?

- A) Na^+
- B) NO_3^-
- C) NO_2^-
- D) NH_4^+
- E) N^{3-}

25) Which one of the following compounds is chromium(III) oxide?

- A) Cr_2O_3
- B) CrO_3
- C) Cr_3O_2
- D) Cr_3O
- E) Cr_2O_4

26) What is the correct formula for ammonium sulfide?

- A) NH_4SO_3
- B) $(\text{NH}_4)_2\text{SO}_3$
- C) $(\text{NH}_4)_2\text{S}$
- D) NH_3S
- E) N_2S_3

27) Which formula/name pair is incorrect

- A) FeSO_4 iron(II) sulfate
- B) $\text{Fe}_2(\text{SO}_3)_3$ iron(III) sulfite
- C) FeS iron(II) sulfide
- D) FeSO_3 iron(II) sulfite
- E) $\text{Fe}_2(\text{SO}_4)_3$ iron(III) sulfide

28) The formula for the compound formed between aluminum ions and phosphate ions is

- A) $\text{Al}_3(\text{PO}_4)_3$
- B) AlPO_4
- C) $\text{Al}(\text{PO}_4)_3$
- D) $\text{Al}_2(\text{PO}_4)_3$
- E) AlP

29) Barium reacts with a polyatomic ion to form a compound with the general formula $\text{Ba}_3(\text{X})_2$. What would be the most likely formula for the compound formed between sodium and the polyatomic ion X?

- A) NaX
- B) Na_2X
- C) Na_2X_2
- D) Na_3X
- E) Na_3X_2

30) Which one of the following is TRUE concerning the simplest unit of MgCl_2 ?

- A) 1 Mg atom and 1 Cl_2 molecule
- B) 1 MgCl_2 molecule
- C) 1 Mg atom and 2 chlorine atoms
- D) 1 positive ion and 2 negative ions
- E) 1 positive and 1 negative ion

Mole Concept

31) The molar mass of $(\text{NH}_4)_3\text{PO}_4$ is

- A) 116.03 g/mol
- B) 121.07 g/mol
- C) 149.09 g/mol
- D) 155.42 g/mol
- E) 242.01 g/mol

32) One mole of _____ contains the largest number of atoms.

- A) S_8
- B) C_{10}H_8
- C) $\text{Al}_2(\text{SO}_4)_3$
- D) Na_3PO_4
- E) Cl_2

33) A 30.5 gram sample of glucose ($\text{C}_6\text{H}_{12}\text{O}_6$) contains _____ mol of glucose.

- A) 0.424
- B) 0.169
- C) 5.90
- D) 2.36
- E) 0.136

34) How many moles of oxygen are in 1.08 moles of $\text{Ca}(\text{NO}_3)_2$?

- A) 7.55 moles
- B) 1.43 moles
- C) 6.48 moles
- D) 33.8 moles
- E) 1.16×10^{23} moles

35) How many grams of calcium nitrate, $\text{Ca}(\text{NO}_3)_2$, contains 24 grams of oxygen atoms?

- A) 164 grams
- B) 96 grams
- C) 62 grams
- D) 50. grams
- E) 41 grams

36) How many molecules of CH_4 are in 48.2 g of this compound?

- A) 5.00×10^{24}
- B) 3.00
- C) 2.90×10^{25}
- D) 1.81×10^{24}
- E) 4.00

37) What number of moles of O_2 is needed to produce 14.2 grams of P_4O_{10} from P in a synthesis reaction where 1 mol of P_4O_{10} is produced for every 5 mol O_2 that reacts?

(Molecular weight $\text{P}_4\text{O}_{10} = 284$)

- A) 0.0500 mole
- B) 0.0625 mole
- C) 0.125 mole
- D) 0.250 mole
- E) 0.500 mole

38) Which of the following gas samples contains the greatest mass of gas molecules?

- A) 1.0 liter of He at STP
- B) 1.0 liter of Xe at STP
- C) 1.0 liter of H_2 at STP
- D) All three are the same.

2. Fill in the gaps in the following table, assuming each column represents a neutral atom:

Symbol	${}^{39}_{19}\text{K}$				
Protons		25			82
Neutrons		30	64		
Electrons			48	56	
Mass #				137	207

Know the following groups: Metals, Nonmetals, Metalloids, Alkali metals, Alkaline Earth metals, transition metals, Nobel gases, Halogens, inner transitions, lanthanoids, Actinoids.

Periodic Table of the Elements

1													18									
1 H Hydrogen 1.008																		2 He Helium 4.002				
3 Li Lithium 6.941	4 Be Beryllium 9.012																5 B Boron 10.811	6 C Carbon 12.011	7 N Nitrogen 14.007	8 O Oxygen 15.999	9 F Fluorine 18.998	10 Ne Neon 20.180
11 Na Sodium 22.990	12 Mg Magnesium 24.305																13 Al Aluminum 26.982	14 Si Silicon 28.086	15 P Phosphorus 30.974	16 S Sulfur 32.066	17 Cl Chlorine 35.453	18 Ar Argon 39.948
19 K Potassium 39.098	20 Ca Calcium 40.078	21 Sc Scandium 44.956	22 Ti Titanium 47.88	23 V Vanadium 50.942	24 Cr Chromium 51.996	25 Mn Manganese 54.938	26 Fe Iron 55.933	27 Co Cobalt 58.933	28 Ni Nickel 58.693	29 Cu Copper 63.546	30 Zn Zinc 65.39	31 Ga Gallium 69.723	32 Ge Germanium 72.61	33 As Arsenic 74.922	34 Se Selenium 78.09	35 Br Bromine 79.904	36 Kr Krypton 84.80					
37 Rb Rubidium 84.468	38 Sr Strontium 87.62	39 Y Yttrium 88.906	40 Zr Zirconium 91.224	41 Nb Niobium 92.906	42 Mo Molybdenum 95.94	43 Tc Technetium 98.907	44 Ru Ruthenium 101.07	45 Rh Rhodium 102.906	46 Pd Palladium 106.42	47 Ag Silver 107.868	48 Cd Cadmium 112.411	49 In Indium 114.818	50 Sn Tin 118.71	51 Sb Antimony 121.760	52 Te Tellurium 127.6	53 I Iodine 126.904	54 Xe Xenon 131.29					
55 Cs Cesium 132.905	56 Ba Barium 137.327	57-71 Lanthanides	72 Hf Hafnium 178.49	73 Ta Tantalum 180.948	74 W Tungsten 183.85	75 Re Rhenium 186.207	76 Os Osmium 190.23	77 Ir Iridium 192.22	78 Pt Platinum 195.08	79 Au Gold 196.967	80 Hg Mercury 200.59	81 Tl Thallium 204.383	82 Pb Lead 207.2	83 Bi Bismuth 208.980	84 Po Polonium [209]	85 At Astatine 209.987	86 Rn Radon 222.018					
87 Fr Francium 223.020	88 Ra Radium 226.025	89-103 Actinides	104 Rf Rutherfordium [261]	105 Db Dubnium [262]	106 Sg Seaborgium [266]	107 Bh Bohrium [264]	108 Hs Hassium [269]	109 Mt Meitnerium [268]	110 Ds Darmstadtium [269]	111 Rg Roentgenium [272]	112 Cn Copernicium [277]	113 Uut Ununtrium unknown	114 Fl Flerovium [289]	115 Uup Ununpentium unknown	116 Lv Livermorium [293]	117 Uus Ununseptium unknown	118 Uuo Ununoctium unknown					
57 La Lanthanum 138.906	58 Ce Cerium 140.115	59 Pr Praseodymium 140.908	60 Nd Neodymium 144.24	61 Pm Promethium 144.912	62 Sm Samarium 150.36	63 Eu Europium 151.966	64 Gd Gadolinium 157.25	65 Tb Terbium 158.925	66 Dy Dysprosium 162.50	67 Ho Holmium 164.930	68 Er Erbium 167.26	69 Tm Thulium 168.934	70 Yb Ytterbium 173.04	71 Lu Lutetium 174.967								
89 Ac Actinium 227.028	90 Th Thorium 232.038	91 Pa Protactinium 231.036	92 U Uranium 238.029	93 Np Neptunium 237.048	94 Pu Plutonium 244.064	95 Am Americium 243.061	96 Cm Curium 247.070	97 Bk Berkelium 247.070	98 Cf Californium 251.080	99 Es Einsteinium [254]	100 Fm Fermium 257.095	101 Md Mendelevium 258.1	102 No Nobelium 259.101	103 Lr Lawrencium [262]								

Know the name and symbols of 1 – 40, 46 – 58, 78 - 94

Can you assign oxidation numbers?

Determine the oxidation number of the atoms indicated in the compound/molecule.

In KMnO_4 K: Mn:

In CaSO_4 S: O:

In NaOCl O: Cl:

In F_2 F:

SO_2 S: O: