

# Periodic Table of the Elements

1 H 1.00794		2 He 4.002602	
3 Li 6.941	4 Be 9.012182	5 B 10.811	6 C 12.0107
11 Na 22.989770	12 Mg 24.3050	13 Al 26.981538	14 Si 28.0855
19 K 39.0983	20 Ca 40.078	21 Sc 44.955910	22 Ti 47.867
37 Rb 85.4678	38 Sr 87.62	39 Y 88.90585	40 Zr 91.224
55 Cs 132.90545	56 Ba 137.327	57 La 138.9055	58 Ce 140.116
87 Fr (223)	88 Ra (226)	89 Ac (227)	90 Th (232)
23 V 50.9415	24 Cr 51.9961	25 Mn 54.938049	26 Fe 55.845
41 Nb 92.90638	42 Mo 95.94	43 Tc (98)	44 Ru 101.07
73 Ta 180.9479	74 W 183.84	75 Re 186.207	76 Os 190.23
105 Db (262)	106 Sg (263)	107 Bh (262)	108 Hs (265)
104 Rf (261)	105 Db (262)	106 Sg (263)	107 Bh (262)
27 Co 58.933200	28 Ni 58.6934	29 Cu 63.546	30 Zn 65.39
45 Rh 102.90550	46 Pd 106.42	47 Ag 107.8682	48 Cd 112.411
77 Ir 192.217	78 Pt 195.078	79 Au 196.96655	80 Hg 200.59
110 Mt (266)	110 Pt (269)	111 Au (272)	112 Hg (277)
49 Ga 69.723	50 Ge 72.61	51 As 74.92160	52 Se 78.96
81 Tl 204.3833	82 Pb 207.2	83 Bi 208.98038	84 Po (209)
114 Fl (289)	114 Pb (287)	116 Lv (289)	118 Og (293)
31 Ga 69.723	32 Ge 72.61	33 As 74.92160	34 Se 78.96
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81 Tl 204.3833	82 Pb 207.2	83 Bi 208.98038	84 Po (209)
114 Fl (289)	114 Pb (287)	116 Lv (289)	118 Og (293)
61 Pm (145)	62 Sm 150.36	63 Eu 151.964	64 Gd 157.25
93 Np (237)	94 Pu (244)	95 Am (243)	96 Cm (247)
91 Pa (231)	92 U 238.0289	93 Np (237)	94 Pu (244)
90 Th (232)	91 Pa (231)	92 U 238.0289	93 Np (237)
65 Tb 158.92534	66 Dy 162.50	67 Ho 164.93032	68 Er 167.26
97 Bk (247)	98 Cf (251)	99 Es (252)	100 Fm (257)
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97 Bk (247)	98 Cf (251)	99 Es (252)	100 Fm (257)
69 Tm 168.93421	70 Yb 173.04	71 Lu 174.967	72 Hf 178.49
101 Md (258)	102 No (259)	103 Lr (262)	104 Rf (261)
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**Multiple Choice:** Select the best answer.

Round all molar masses from the Periodic Table to 2 decimal places.

1 Convert 0.06200 liters of hydrogen gas into milliliters of hydrogen gas.

- A) 620 mL
- B) 62 mL
- C) 62.0 mL
- D) 62.00 mL
- E) 620. mL

2)  $14.538 - 2.37 =$

- A) 12.17
- B) 12.168(ignore sig figs and used the answer displayed on the calculator)
- C) 12.2(rounded to the incorrect decimal place)
- D) 16.908(added and did not round to the correct number of decimal places)
- E) 16.10(added)

3) Which of subatomic particles can be found in the the nucleus of the atom?

- A)  $p^+$  & n
- B)  $p^+$
- C) n
- D)  $e^-$
- E)  $e^-$  &  $p^+$

4) For  $^{73}\text{Ge}$  determine the number of  $p^+$ ,  $e^-$ , and n.

- A) 32  $p^+$ , 32  $e^-$ , n 41
- B) 32  $p^+$ , 32  $e^-$ , n 73
- C) 73  $p^+$ , 73  $e^-$ , n 41
- D) 41  $p^+$ , 41  $e^-$ , n 32
- E) 73  $p^+$ , 32  $e^-$ , n 41

5) What is the electron configuration of potassium?

- A)  $1s^2 2s^2 2p^3$
- B)  $1s^2 2s^2 2p^6 3s^2 3p^6 4s^2 3d^{10} 4p^4$
- C)  $1s^2 2s^2 2p^6 3s^2 3p^3$
- D)  $1s^2 2s^2 2p^6 3s^2 3p^6 4s^1$
- E)  $1s^2 2s^2 2p^6 3s^1$

6) Which would be the dot notation for arsenic



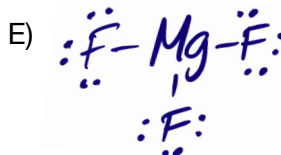
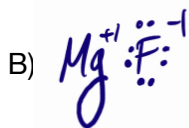
7) Which of the following represents silicon

- A)  $\frac{1\uparrow}{1s} \quad \frac{1\uparrow}{2s} \quad \frac{1\uparrow}{2p} \quad \frac{1\uparrow}{2p} \quad \frac{1\uparrow}{2p} \quad \frac{1\uparrow}{3s} \quad \frac{1\uparrow}{3p} \quad \frac{1\uparrow}{3p} \quad \frac{1\uparrow}{3p}$
- B)  $\frac{1\uparrow}{1s} \quad \frac{1\uparrow}{2s} \quad \frac{1\uparrow}{2p} \quad \frac{1\uparrow}{2p} \quad \frac{1\uparrow}{2p} \quad \frac{1\uparrow}{3s} \quad \frac{1\uparrow}{3p} \quad \frac{1\uparrow}{3p} \quad \frac{1\uparrow}{3p}$
- C)  $\frac{1\uparrow}{1s} \quad \frac{1\uparrow}{2s} \quad \frac{1\uparrow}{2p} \quad \frac{1\uparrow}{2p} \quad \frac{1\uparrow}{2p} \quad \frac{1\uparrow}{3s} \quad \frac{1\uparrow}{3p} \quad \frac{1\uparrow}{3p} \quad \frac{1\uparrow}{3p}$
- D)  $\frac{1\uparrow}{1s} \quad \frac{1\uparrow}{2s} \quad \frac{1\uparrow}{2p} \quad \frac{1\uparrow}{2p} \quad \frac{1\uparrow}{2p} \quad \frac{1\uparrow}{3s} \quad \frac{1\uparrow}{3p} \quad \frac{1\uparrow}{3p} \quad \frac{1\uparrow}{3p}$
- E)  $\frac{1\uparrow}{1s} \quad \frac{1\uparrow}{2s} \quad \frac{1\uparrow}{2p} \quad \frac{1\uparrow}{2p} \quad \frac{1\uparrow}{2p} \quad \frac{1\uparrow}{3s} \quad \frac{1\uparrow}{3p} \quad \frac{1\uparrow}{3p} \quad \frac{1\uparrow}{3p}$

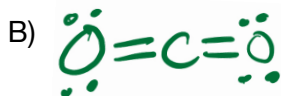
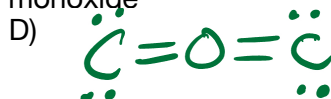
8) Which pair of elements would form an ionic bond?

- A) Na & F  
 B) C & O  
 C) H & Br  
 D) N & N  
 E) N & H

9) Which is the Lewis structure of magnesium fluoride



10) Which is the Lewis structure of carbon monoxide



- 11) What is the geometry(shape) of phosphorus trichloride?  
A) trigonal pyramidal  
B) tetrahedral  
C) bent  
D) linear  
E) trigonal planar
- 12) What bond angle(s) does hydrogen bromide?  
A)  $128^\circ$   
B)  $180^\circ$   
C)  $109.5^\circ$   
D) Less than  $109.5^\circ$   
E)  $120^\circ$
- 13) How many grams of iron are in 0.274 moles of iron?  
A) 15.3 g iron  
B) 0.0144 g iron  
C) 0.00491 g iron  
D) 5.21 g iron  
E) 0.0112 g iron
- 14) Convert  $6.50 \times 10^{-11}$  moles of arsenic into atoms of arsenic.  
A)  $8.68 \times 10^{-13}$  atoms arsenic  
B)  $1.08 \times 10^{-34}$  atoms arsenic  
C)  $3.91 \times 10^{13}$  atoms arsenic  
D)  $4.87 \times 10^{-9}$  atoms arsenic  
E)  $6.50 \times 10^{-11}$  atoms arsenic
- 15) Determine the number of nitrate ions in 0.500 grams of cobalt(II) nitrate.  
A) 0.00272 nitrate ions  
B)  $3.29 \times 10^{21}$  nitrate ions  
C)  $1.65 \times 10^{21}$  nitrate ions  
D) 0.00546 nitrate ions  
E)  $2.49 \times 10^{21}$  nitrate ions
- 16) Calculate the percent by mass of sulfur in sodium sulfate.  
A) 22.58 %S  
B) 26.87 %S  
C) 16.19 %S  
D) 19.31 %S  
E) 24.22 %S
- 17) What is the empirical formula for a compound that is 13.86% nitrogen, 47.47% oxygen, and 38.67% potassium?  
A)  $\text{NO}_3\text{K}$   
B)  $\text{N}_3\text{OK}$   
C)  $\text{NOK}_3$   
D)  $\text{NO}_5\text{K}_4$   
E)  $\text{NOK}$

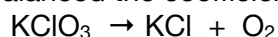
18) What are the products formed when barium nitrate reacts with potassium sulfate?

- A) BaK + SO<sub>4</sub>(NO<sub>3</sub>)<sub>2</sub>
- B) BaSO<sub>4</sub>K<sub>2</sub>SO<sub>4</sub>
- C) BaSO<sub>3</sub> + K<sub>2</sub>NO<sub>3</sub>
- D) BaS + 2KNO<sub>3</sub>
- E) BaSO<sub>4</sub> + 2KNO<sub>3</sub>

19) Predict the products of the combustion of propane(C<sub>3</sub>H<sub>8</sub>)

- A) C + H
- B) C + H<sub>2</sub>
- C) CO<sub>2</sub> + H<sub>2</sub>O
- D) C + H<sub>2</sub>O
- E) CO<sub>2</sub> + H<sub>2</sub>

20) When the following reaction is balanced the coefficient in front of potassium chloride is

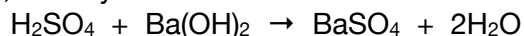


- A) 1
- B) 2
- C) 3
- D) 4
- E) 5

21) How many grams of hydrogen are formed when 2.45 grams of hydrochloric acid reacts with strontium metal?

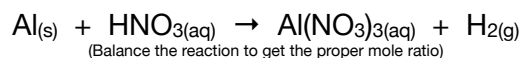
- A) 0.0679 g hydrogen
- B) 0.717 g hydrogen
- C) 0.383 g hydrogen
- D) 0.7172 g hydrogen
- E) 0.71725 g hydrogen

22) In the following reaction, identify the acid



- A) There is no acid in the reaction
- B) H<sub>2</sub>O
- C) H<sub>2</sub>SO<sub>4</sub>
- D) Ba(OH)<sub>2</sub>
- E) BaSO<sub>4</sub>

23) Referring to the reaction below, what is a proper mole ratio between the aqueous reactant and the gaseous product



- A) 1 mole Al / 1 mole H<sub>2</sub>
- B) 2 mole Al / 3 mole H<sub>2</sub>
- C) 1 mole HNO<sub>3</sub> / 1 mole H<sub>2</sub>
- D) 3 mole HNO<sub>3</sub> / 3 mole H<sub>2</sub>
- E) 6 mole HNO<sub>3</sub> / 3 mole H<sub>2</sub>

24) Determine the limiting reactant when 2.76 g potassium reacts with 2.65 g chlorine to form potassium chloride.

- A) K
- B)  $\text{Cl}_2$
- C) KCl
- D) Cl
- E)  $\text{K}_2$

25) Convert 823 mmHg into atmospheres

- A) 3.01 atm
- B) 1,096 atm
- C) 1,583 atm
- D) 1.08 atm
- E) 0.00813

26) A 1.33 L sample of carbon dioxide gas is at  $22^\circ\text{C}$  and 755 mmHg. What is the temperature of the gas if the pressure becomes 817 mmHg and allowed to expand to 1.85 L?

- A)  $171^\circ\text{C}$
- B)  $33^\circ\text{C}$
- C)  $273^\circ\text{C}$
- D)  $0.00225^\circ\text{C}$
- E)  $0.0302^\circ$

27) What is the pressure of a 0.348 mol gas sample at  $19^\circ\text{C}$  and occupies 0.750 L? [note: Ideal gas constant is  $0.0821 \text{ (L atm)/(mol K)}$ ]

- A) 135 atm
- B) 0.724 atm
- C) 1.00 atm
- D) 11.1 atm
- E) 22.4 atm

28) Calculate the concentration (M) of a solution that has 5.67 g sodium carbonate dissolved enough water to make a 285 mL solution.

- A) 19.9 M
- B) 0.0199 M
- C) 1.95 M
- D) 0.188 M
- E) 0.240 M

29) What is the proper name for the compound  $\text{Co}(\text{SO}_4)_2$

- A) cobalt sulfate
- B) cobalt sulfur tetroxide
- C) cobalt(IV) sulfate
- D) copper sulfur tetroxide
- E) copper(IV) sulfate

30) What is the molar mass of ammonium sulfide?

- A) 66.15 g/mol
- B) 50.12 g/mol
- C) 68.17 g/mol
- D) 49.11 g/mol
- E)  $6.022 \times 10^{23}$  g/mol

This is practice. This does not cover every single topic you should have learned in previous chemistry courses. If you do not feel confident in your knowledge and ability to solve problems in chemistry, the chemistry department strongly suggests that you enroll into Chem 100(Introductory Chemistry). Chem 100 is a single semester course that is offered Fall, Spring, Summer, and usually during Spring Intersession.

- 1) D
- 2) A
- 3) A
- 4) A
- 5) D
- 6) B
- 7) E
- 8) A
- 9) D
- 10) C

- 11) A
- 12) B
- 13) A
- 14) C
- 15) B
- 16) A
- 17) A
- 18) E
- 19) C
- 20) B

- 21) A
- 22) C
- 23) E
- 24) A
- 25) D
- 26) A
- 27) D
- 28) D
- 29) C
- 30) C