

### Answer Key for Exam 1a

1.	a (c -1)
2.	a. 6      b. exact      c. 7      d. 4
3.	a. ionic b. molecular c. ionic d. molecular
4.	c
5.	empirical formula = SCl; molecular formula = S <sub>2</sub> Cl <sub>2</sub>
6.	a. magnesium carbonate b. phosphorus trifluoride c. iron(III) sulfide d. calcium nitrate
7.	a. Cr(NO <sub>2</sub> ) <sub>3</sub> b. K <sub>2</sub> SO <sub>4</sub> c. (NH <sub>4</sub> ) <sub>2</sub> S d. Mg <sub>3</sub> (PO <sub>4</sub> ) <sub>2</sub>
8.	e (d -2)
9.	507 g HCl
10.	<sup>27</sup> <sub>13</sub> Al
11.	a. transition metal b. alkaline earth metal c. noble gas d. halogen
12.	a. O <sub>2</sub> limiting, theoretical yield = 109 g NO b. 98.0 g H <sub>2</sub> O c. % yield = 92.7%
13.	a. 2Co(NO <sub>3</sub> ) <sub>3</sub> (aq) + 3K <sub>2</sub> SO <sub>4</sub> (aq) → Co <sub>2</sub> (SO <sub>4</sub> ) <sub>3</sub> (s) + 6KNO <sub>3</sub> (aq) b. 4Al(s) + 3O <sub>2</sub> (g) → 2Al <sub>2</sub> O <sub>3</sub> (s)
14.	c (a -1)
15.	d (b -2)
16.	7.4×10 <sup>23</sup> molecules H <sub>2</sub> O <sub>2</sub>
17.	2660 g
18.	a (d -1)
19.	e
20.	1.8 g S
21.	a. 8 protons, 10 electrons b. 20 protons, 18 electrons
22.	0.6973 lb/in <sup>3</sup>
23.	b (c -1)
24.	a
25.	b (c -2)

### Answer Key for Exam 1b

1.	a. iron(III) sulfide b. calcium nitrate c. magnesium carbonate d. phosphorus trifluoride
2.	a. $Mg_3(PO_4)_2$ b. $Cr(NO_2)_3$ c. $K_2SO_4$ d. $(NH_4)_2S$
3.	d (a -1)
4.	c
5.	empirical formula = $C_2H_5$ ; molecular formula = $C_4H_{10}$
6.	b (a-1)
7.	$7.4 \times 10^{23}$ molecules $H_2O_2$
8.	a. $NH_3$ limiting, theoretical yield = 115 g NO b. 103 g $H_2O$ c. % yield = 87.8%
9.	b (c -1)
10.	a. 6      b. exact      c. 7      d. 4
11.	a. molecular b. ionic c. molecular d. ionic
12.	a. $2Co(NO_3)_3(aq) + 3K_2SO_4(aq) \rightarrow Co_2(SO_4)_3(s) + 6KNO_3(aq)$ b. $4Al(s) + 3O_2(g) \rightarrow 2Al_2O_3(s)$
13.	345 g HCl
14.	a
15.	e
16.	$^{33}_{16}S$
17.	a. 8 protons, 10 electrons b. 20 protons, 18 electrons
18.	a. halogen b. alkaline earth metal c. noble gas d. transition metal
19.	2660 g
20.	1.8 g S
21.	a (d -1)
22.	e
23.	d (c -2)
24.	b (d -2)
25.	$0.6973 \text{ lb/in}^3$

### Answer Key for Exam 1c

1.	b (a,c -1)
2.	a. 4      b. exact      c. 5      d. 5
3.	a. ionic b. ionic c. molecular d. molecular
4.	a (b -2)
5.	empirical formula = $\text{NF}_3$ ; molecular formula = $\text{NF}_3$
6.	$^{40}_{18}\text{Ar}$
7.	c
8.	a. $\text{O}_2$ limiting, theoretical yield = 313 g $\text{CO}_2$ b. 64.2 g $\text{H}_2\text{O}$ c. % yield = 91.1%
9.	a. magnesium nitrate b. potassium sulfide c. iron(II) carbonate d. sulfur trioxide
10.	a. $\text{K}_2\text{CO}_3$ b. $(\text{NH}_4)_2\text{SO}_4$ c. $\text{Fe}(\text{NO}_2)_3$ d. $\text{Al}_2\text{O}_3$
11.	a. transition metal b. alkali metal c. noble gas d. halogen
12.	817 g $\text{CO}_2$
13.	a. $2\text{Co}(\text{NO}_3)_3(\text{aq}) + 3\text{K}_2\text{SO}_4(\text{aq}) \rightarrow \text{Co}_2(\text{SO}_4)_3(\text{s}) + 6\text{KNO}_3(\text{aq})$ b. $4\text{Al}(\text{s}) + 3\text{O}_2(\text{g}) \rightarrow 2\text{Al}_2\text{O}_3(\text{s})$
14.	c (a -2)
15.	d (b -2)
16.	$1.6 \times 10^{24}$ molecules $\text{CH}_4$
17.	2660 g
18.	d (a -1)
19.	b
20.	2.0 g Mg
21.	a. 16 protons, 18 electrons b. 19 protons, 18 electrons
22.	0.6973 $\text{lb/in}^3$
23.	b (c -1)
24.	a
25.	b (c -2)

### Answer Key for Exam 1d

1.	a. magnesium nitrate b. potassium sulfide c. iron(II) carbonate d. sulfur trioxide
2.	a. $K_2CO_3$ b. $(NH_4)_2SO_4$ c. $Fe(NO_2)_3$ d. $Al_2O_3$
3.	a (d -1)
4.	c
5.	empirical formula = $NO_2$ ; molecular formula = $N_2O_4$
6.	b (a -1)
7.	2.0 g Mg
8.	a. $C_6H_6$ limiting, theoretical yield = 345 g $CO_2$ b. 70.6 g $H_2O$ c. % yield = 123%
9.	b (a,c -1)
10.	a. 5    b. 4    c. 5    d. exact
11.	a. $2Co(NO_3)_3(aq) + 3K_2SO_4(aq) \rightarrow Co_2(SO_4)_3(s) + 6KNO_3(aq)$ b. $4Al(s) + 3O_2(g) \rightarrow 2Al_2O_3(s)$
12.	b (d -2)
13.	2660 g
14.	a. transition metal b. noble gas c. alkali metal d. halogen
15.	a. molecular b. ionic c. ionic d. molecular
16.	c
17.	a (b -2)
18.	496 g $CO_2$
19.	$^{38}_{17}Cl$
20.	a
21.	d (a -1)
22.	a. 16 protons, 18 electrons b. 19 protons, 18 electrons
23.	$0.6973 \text{ lb/in}^3$
24.	b (c -2)
25.	$1.6 \times 10^{24}$ molecules $CH_4$