# Honors Review

1) Notes or google

2) endothermic temp decrease

Exothermic temp increase

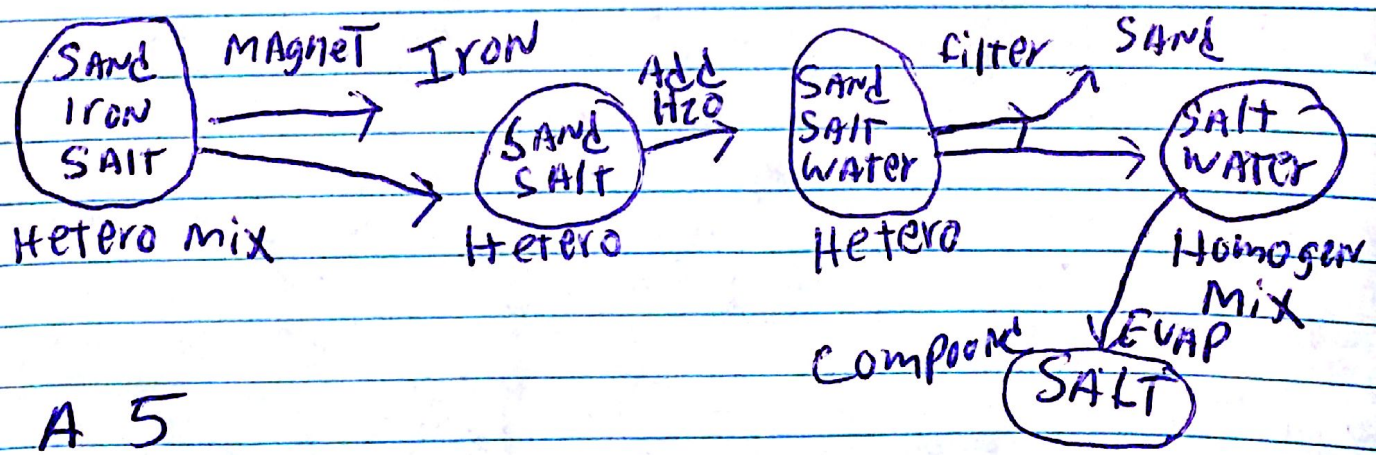
3) bubbles (form gas)
color change
temp change
precipatate forms

4) solid - tight packing, fixed volume
fixed shape, low energy

liquid - loose packing, fixed volume
undefined shape, mid energy

gas - not packed, undefined volume
undefined shape, high energy

5)




6 A 5
B 4
C 4
d 2

6 PART 2

a) .138915 → 0.139

b) .0043 → .004

c) 3888 + 223852 84
4000 + 2240 − 80 = 6160 → 6000

d) 442.548 → 440

Sci NOT
$1.18 \times 10^{5}$ $1.50 \times 10^{-6}$ 5256000 .00001528

7a milli centi deci base deca hecto Kilo

b 150 000 mg .01505 L .00025068 km

10101000 cg

8 $d = \frac{m}{V}$ $\frac{230.34}{52} = 4.4296 \rightarrow 4.4$ g/mL

9 Intensive & can be used to determine what material is

$M = d \times V$ $1.55 \times 10^{-5}$ g/mL $\times$ 2300 mL = .0357 g

10) - Same compound must have same amount of the same elements

- different number of elements results in making a different compound

- Conservation of matter - states matter not created or destroyed in chem or phys reactions

11) No gained mass

gas was combined to create a new compound in crucible

Yes - seal the system to prevent gas from entering

isotope - atom of element with different mass due to diff # of neutrons

1/2 life - time required to convert 1/2 of atoms of an isotop to a new isotope

12) F Na

13) a) similar size
b) same # of valance $e^-$ so similar property

14) A) little mass, neg charge - electron cloud
B) 1 mass unit, no charge - nucleus
C) 1 mass unit, positive charge - nucleus

15

| | $p^+$ | $n^0$ | $e^-$ | Ve |
|---|---|---|---|---|
| Ca | 20 | 20 | 20 | 2 |
| F | 9 | 10 | 9 | 7 |
| N | 7 | 7 | 7 | 5 |
| Cl | 17 | 18 | 17 | 7 |

16 $^{208}_{82}Pb$ $^{40}_{18}Ar$

$^{208}_{82}Pb \xrightarrow{\text{ALPHA}} {}^{4}_{2}He + {}^{204}_{80}Hg$

$^{208}_{82}Pb \xrightarrow{\text{BETA}} {}^{0}_{-1}\beta + {}^{208}_{83}Bi$

$^{40}_{18}Ar \xrightarrow{\text{ALPHA}} {}^{4}_{2}He + {}^{36}_{16}S$

$^{40}_{18}Ar \xrightarrow{\text{BETA}} {}^{0}_{-1}\beta + {}^{40}_{19}K$

17 look up

| 18 | A | B | C |
|---|---|---|---|
| NAME | Phosphorus | Arsenic | Bromine |
| CLASS | NON METAL | metalloid ~~NON METAL~~ | NON METAL |
| NUCL SYM | $^{31}_{15}P$ | $^{75}_{33}AS^{-3}$ | $^{78}_{35}Br$ |
| $p^+$ | 15 | 33 | 35 |
| $e^-$ | 15 | 36 | 35 |
| $n^0$ | 16 | 42 | 43 |
| MASS # | 31 | 75 | 78 |
| ve | 5 | 8 | 7 |
| Lewis dot | :P: | :AS:$^{-3}$ | :Br: |

1) $3(40.08) + 2(30.98) + 8(16.00) = 310.2$

$120.24 \quad 61.96 \quad 128$

$$100 \times \left(\frac{120.24}{310.2}\right) = 38.76\ \%$$

2) $2(26.98) + 3(32.06) + 12(16.00) = 342.14\ \frac{g}{mol}$

$53.96 + 96.18 \quad 192$

3) $3.50 \times (40.08 + 3(16) + 3(1.01)) = 318.78$

$\Downarrow$

$319\ g/mol$

4) $\frac{45.0\ g}{12.01 + 2(16.00)} = 1.022727 \Rightarrow 1.02\ mol\ CO_2$

5) $\frac{2.25 \times 10^{23}\ Atom}{6.022 \times 10^{23}\ \frac{Atom}{mol}} = .3736\ mol \times 24.31\ g/mol$

$= 9.08295 \Rightarrow 9.08\ g$

6) $\frac{2.23 \times 10^{24}}{6.022 \times 10^{23}} = 3.7031 \times (2(16.00))\ 118.498$

$\Downarrow$

$118\ g\ O_2$

7) $\frac{150.0}{342.14} = .43842 \times 6.022 \times 10^{23}$

$= 2.640147 \times 10^{23} \Rightarrow 2.640 \times 10^{23}$ molecules

8) $Q = mC\Delta t \Rightarrow 50.0\,g \cdot 4.184\,J/g°C \cdot 58.0°C$

$= 12133.6\,J \Rightarrow 12100\,J$

10) $C = \frac{Q}{m\Delta T}$ $\frac{96.25\,J}{550.7\,g \cdot 10.0} = 0.01747775$

$\Downarrow$

$0.0175\,J/g°C$

Hydrate

| | |
|---|---|
| m H | 16.280 |
| m AH | 13.880 |
| m $H_2O$ | 2.400 |

$\frac{2.400}{18.02} = \frac{.1332}{.06665} = 2$

$137.33 + 2(35.45)$

$\frac{13.880}{208.23} = \frac{.06665}{.06665} = 1$

$BaCl_2 \cdot 2H_2O$

Barium chloride dihydrate

10 $\frac{1.841 \times 10^{21}\text{ molecules}}{6.022 \times 10^{23}\ \frac{\text{molecules}}{\text{mol}}} = .003057$ mol

11 $\frac{2200\,g}{342.14\,g/mol} \times 6.022 \times 10^{23} = 3.87 \times 10^{24}$ molecules

12) Find 25.5% of 325.0 g

$325.0 \times .255 = 82.88\,g$

$10(12.01) + 12(1.01) + 2(16.00)$
$164.22$

$\frac{82.88\,g}{164.22\,g/mol} \times 6.022 \times 10^{23} = 3.039 \times 10^{23}$ molecules

13) $\frac{1.24}{30.97} = \frac{.040}{.040} = 1$ $\quad \frac{1.92}{16.00} = \frac{.12}{.040} = 3$

Em P = $PO_3$ $\quad 30.97 + 3(16.00) = 78.97$

$\frac{398}{78.97} = 5.03$ molecular = $P_5O_{15}$

14 $\frac{32.38}{22.99} = \frac{1.41}{.706} \Downarrow 2$ $\quad \frac{22.65}{32.06} = \frac{.706}{.706} \Downarrow 1$ $\quad \frac{44.99}{16.00} = \frac{2.81}{.706} \Downarrow 4$

$Na_2SO_4$

1 Sodium Bromide
2 Calcium Acetate
3 diPhosPhorus PenToxide
4 titanium SulFate
5 Iron III PhosPHate
6 PoTASSium Nitride
7 Sulfur dioxide
8 Copper I Hydroxide
9 Zinc NiTrATe
10 CobAlt III SulFide

11 $SiO_2$
12 $Ni_2S_3$
13 $CuCrO_4$
14 $AgC_2H_3O_2$
15 $B_2Br_4$
16 $Mg(OH)_2$
17 $Sn(CO_3)_2$
18 $(NH_4)_2O$
19 $SnSe_2$
20 $CCl_4$

15 A $1s^2 2s^1$
B $1s^2 2s^2 2p^5$

C $1s^2 2s^2 2p^6$
d $1s^2 2s^2 2p^6 3s^2 3p^6 4s^1 3d^{10}$

17 1 = 1s so 2
2 = 2s & 2P so 8
3 = 3s 3P 3d → 18
4 = 3s 3P 3d 4f = 32

19) NOT Covered but Red More Energy
20) use Identifing Color in flAme

E Ti

F $1s^2\ 2s^2\ 2p^6\ 3s^2\ 3p^6\ 4s^2\ 3d^{10}\ 4p^5$

G Na

H [Ar] $4s^1\ 3d^{10}$

S ⇒ 1s ↑↓ 2s ↑↓ 2p ↑↓ ↑↓ ↑↓ 3s ↑↓ 3p ↑↓ ↑ ↑

Ca ⇒ 1s ↑↓ 2s ↑↓ 2p ↑↓ ↑↓ ↑↓ 3s ↑↓ 3p ↑↓ ↑↓ ↑↓ 4s ↑↓

F 1s ↑↓ 2s ↑↓ 2p ↑↓ ↑↓ ↑