

chem 7 5-3-17

comp rev

- ① Given the following EC: $13^{23}29^{30}33^{33}34^{34}$
Select the elements or ions the EC would be:
Cl, Ar, K⁺, Ca, Se
- ② Given the following EC: $13^{23}29^{30}$
Select the elements or ions this EC would be:
O⁻², F, Na, Mg⁺²
- ③ The most electronegative element is ____
As, Zn, Sb, F
- ④ Calculate the % mass of H in $H_2C_2H_3O_2$.
- ⑤ In the formula, $X_3(PO_4)_2$, X would be: Nb, Al, Ca, K, Ar
- ⑥ Choose the compound with an ionic bond:
CH₄, HNO₃, KClO₃, H₂CO
- ⑦ If the EF is CH₂, and the M_m is 84, find MF.
- ⑧ If the EF is NH₂Cl and the M_m of the compound is 51.5, find the MF.
- ⑨ Choose the compound that only contains a covalent bond is ____
NaBr, CH₃Br, Na₂CO₃, KOH
- ⑩ Given the rxn:
 $NaOH + H_2SO_4 \rightarrow H_2O + NaHSO_4$
Name the two main categories that this rxn represents.
- ⑪ Identify the acid:
KOH, CH₃Cl, HClO₄, Ba(OH)₂
- ⑫ Identify the base:
HNO₃, H₂SO₄, NaOH, HCl
- ⑬ A compound is 40% C, 6.7% H and 53.3% O by mass. Find EF. If the M_m is 90, find MF.
- ⑭ A compound is 35.51% C, 4.77% H, 37.85% O, 8.29% N and 13.6% Na. M_m is 169. Find EF and MF.
- ⑮ Student places 10mL H₂O in a graduated cylinder. A 17.2g piece of metal is added to the cylinder and the new volume is 13.5mL. Cal density of metal.
- ⑯ NaCl is added to water and fully dissolves forming a uniform mixture. The mixture is: heterogeneous, solution, colloid, suspension
- ⑰ Rank following elements in increasing size:
I, N, Br, Ti, Ga, Al
- ⑱ Determine the density of the gas UF₆ at 60°C and 145 torr.
1g NaHCO₃ reacts with 1g H₂C₄H₄O₂ by:
 $3NaHCO_3 + H_2C_4H_4O_2 \rightarrow 3CO_2 + 3H_2O + Na_2C_4H_4O_2$
- ⑲ Find LR
- ⑳ Calc the yield (Da) 316mL of Cl₂ gas at Satm and 273K is combined with an excess of cobalt metal by the rxn:
 $Co + Cl_2 \rightarrow CoCl_2(s)$
Calc the mass CoCl₂.
- ㉑ 8.3L of H₂ at STP is reacted with excess MgCl₂:
 $H_2 + MgCl_2 \rightarrow Mg + 2HCl$
Calc mass Mg produced
- ㉒ How many moles O₂ are needed to produce 0.64 moles CO₂ in:
 $C_3H_8 + 5O_2 \rightarrow 3CO_2 + 4H_2O$
- ㉓ Calc volume of 10g Ar gas at 200°C and 640 torr.
- ㉔ Write the net ionic equation for the formation of the solid:
 $AgNO_3 + NaCl \rightarrow AgCl + NaNO_3$
 $Pb(NO_3)_2 + 2KI \rightarrow PbI_2 + 2KNO_3$
 $Ba(NO_3)_2 + Na_2SO_4 \rightarrow BaSO_4 + 2NaNO_3$
 $Fe(NO_3)_3 + 3NaOH \rightarrow Fe(OH)_3 + 3NaNO_3$
- ㉕ Which of the following is not an EF?
NO, C₃H₈, H₂O, C₂H₄
- ㉖ A cylinder contains 1000g Ar at 2050psi and 18°C. If the P is decreased to 650psi at 26°C, calc the moles.
- ㉗ A balloon is filled with 1L He at 23°C and 1atm. The balloon rises to a point where the P is 220 torr and T is -13°C. Calc new V.
- ㉘ A compound has an EF CHCl. A 25mL container of gas at 373K and 750 torr contains 0.8g of the compound. Find MF.
- ㉙ A 93L sample of air cools from 145°C to -22°C while pressure is maintained at 2.85 atm. Calc new V.
- ㉚ Calc density of Xe gas at STP. M_m Xe is 131.29.
- ㉛ How many moles of AsH₃ occupy 0.04L at STP?
- ㉜ A sample of liquid hydrocarbon composed of only C and H, is vaporized into a 0.204L flask at 101°C. The P is 767 torr and the mass of the gas is 0.482g. Find M_m of gas and proper MF.

1 Given the following EC: $1s^2 2s^2 2p^6 3s^2 3p^6$
This EC could Be: Cl, Ar, K^+ , Ca, Sc
Ar or K^+

2 Given the following EC: $1s^2 2s^2 2p^6$
This EC could be: O^{2-} , F, Na, Mg^{+2}

3 The most electronegative element
is _____. As, Zn, Sb, F

4 Calculate the % mass H in $HC_2H_3O_2$

12×2
Ca
 1×3
 16×2

$$\% = \frac{4(1.008)}{60} \times 100 = 6.72\%$$

5 In the formula, $X_3(PO_4)_2$, X could be
Na, Al, Ca, K, Ar

6 Choose the compound with an ionic bond
 CH_4 , HNO_3 , $KClO_3$, H_2CO

If the EF is CH_2 and the Mm of the compound is 84, find MF.

7



51.5

If the EF is NH_2Cl and the Mm of the compound is 51.5, find MF.



A certain form of sodium carbonate is a hydrate = $\text{Na}_2\text{CO}_3 \cdot X\text{H}_2\text{O}$. when

2.558g of $\text{Na}_2\text{CO}_3 \cdot X\text{H}_2\text{O}$ is heated, all the water is lost, leaving 0.948g Na_2CO_3 . what is X?

$$\text{g H}_2\text{O} = 2.558\text{g} - 0.948\text{g} = 1.61\text{g H}_2\text{O}$$

Find moles Na_2CO_3 and H_2O :

$$\frac{0.948\text{g Na}_2\text{CO}_3}{105.99} \times \frac{1}{105.99} = 0.00894421 \text{ moles Na}_2\text{CO}_3$$

$$\frac{1.61\text{g H}_2\text{O}}{18.016} = 0.0893947$$

$$\frac{\text{H}_2\text{O}}{\text{Na}_2\text{CO}_3} = \frac{0.089}{0.0089} = \frac{10}{1} \quad X = 10 \quad \text{Na}_2\text{CO}_3 \cdot 10\text{H}_2\text{O}$$

9 choose the compound with only a covalent bond:
NaBr, CH₃Br, Na₂CO₃, KOH

10 Balance the equation and give the coefficient that multiplies SO₂.



Identify the two categories of rxn this falls into:



acid/base
neutralization

Identify the acid:



Identify the base:



Given 40% C, 6.7% H, 53.3% O by mass find EF.

$$40\text{g C} \times \frac{1}{12.01} = \frac{3.33\text{mol C}}{3.33\ldots} = 1$$

$$6.7\text{g H} \times \frac{1}{1.008} = \frac{6.65\text{mol H}}{3.33\ldots} = 2$$

$$53.3\text{g O} \times \frac{1}{16} = \frac{3.33\text{mol O}}{3.33\ldots} = 1$$



+ 30

$$M_w = 90 \text{ so } \frac{90}{30} = 3$$



monosodium glutamate (MSG) is a flavor enhancer that contains 35.51% C, 4.77% H, 37.85% O, 8.29% N, and 13.6% Na

$$35.51\text{g C} \times \frac{1}{12.01} = \frac{2.96\text{mol C}}{0.592} = 5$$

$$4.77\text{g H} \times \frac{1}{1.008} = \frac{4.73\text{mol H}}{0.592} \approx 8$$

$$37.85\text{g O} \times \frac{1}{16} = \frac{2.37\text{mol O}}{0.592} = 4$$

$$8.29\text{g N} \times \frac{1}{14.01} = \frac{0.592\text{mol N}}{0.592} = 1$$

$$13.6\text{g Na} \times \frac{1}{22.99} = \frac{0.592\text{mol Na}}{0.592} = 1$$



$$\text{EF molar mass} = 169$$

$$M_w \text{ CF} = 169 \text{ so (CF)}$$

~~14~~ 15 Student places 10mL H_2O in a graduated cylinder. Then places 17.2g piece of metal in cylinder. The volume rises to 13.5mL. Calc Density metal.

$$\begin{array}{r} 13.5 \\ 10.0 \\ \hline 3.5 \text{ mL} = V_{\text{metal}} \end{array}$$

$$D = \frac{17.2g}{3.5 \text{ mL}} = \frac{4.9g}{\text{mL}}$$

~~14~~ 16 NaCl is combined with H_2O . The salt fully dissolves making a uniform mixture. The mixture is: heterogeneous, a solution, a colloid, a suspension

~~16~~ 17 Rank the following elements in increasing size (from small to big, L $\rightarrow$ R)

In, B, Tl, Ga, Al

Small B, Al, Ga, In, Tl $\rightarrow$ big

~~4-18~~ 18

Uranium hexafluoride is a solid at room temperature, but it boils at 56°C . Determine the density of UF_6 at 60°C and 745 torr.

~~4-18~~

$$PM = \delta RT$$

$$\text{UF}_6 =$$

$$238 + 6(19) =$$

$$238 + 114$$

$$352$$

$$\delta = \frac{P(M)}{RT}$$

4-23

$$\delta = \frac{(0.98026)(352)}{R(333\text{K})}$$

$$\delta = \frac{12.62\text{g}}{\text{L}}$$

1g of sodium bicarbonate and 1g citric acid are allowed to react by the

following rxn:

19



a. Lim R $\left(\text{NaHCO}_3 \right)$
17m

b. The yield CO_2 mass 0.524gCO_2

c. mass Remaining reactant
 $0.238\text{g H}_3\text{Citric acid}$
Remains

L.R.

$$1\text{g NaHCO}_3 \times \frac{1}{84} = 0.0119 \text{ mole NaHCO}_3 \times \frac{3\text{CO}_2}{3\text{NaHCO}_3} = 0.0119 \text{ mole CO}_2$$

$$\times 44\text{g/mole} = 0.5236\text{g}$$

$$1\text{g H}_3\text{C}_6\text{H}_5\text{O}_7 \times \frac{1}{192.64} = 0.00519 \text{ mole H}_3\text{C}_6\text{H}_5\text{O}_7 \times \frac{3\text{CO}_2}{1\text{H}_3\text{C}_6\text{H}_5\text{O}_7} = 0.01557 \text{ mole CO}_2$$

L

$$0.0119 \text{ mole NaHCO}_3 \times \frac{\text{H}_3\text{C}_6\text{H}_5\text{O}_7}{3\text{NaHCO}_3} = 0.00396 \text{ mole H}_3\text{C}_6\text{H}_5\text{O}_7$$

$$\times 192.64 = 0.764\text{g}$$

$$\text{Mass rem} = 1 - 0.764\text{g} = 0.2359\text{g H}_3\text{C}_6\text{H}_5\text{O}_7$$

~~18~~ ~~10~~ ~~10~~

5g of cobalt metal is combined with 316 mL of chlorine at 5 atm and

~~18~~ ~~10~~ ~~10~~ 0°C, to produce cobalt (II) chloride.

~~18~~ ~~10~~ ~~10~~ 20

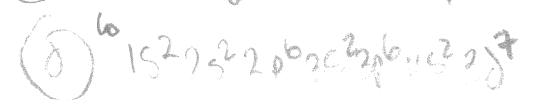
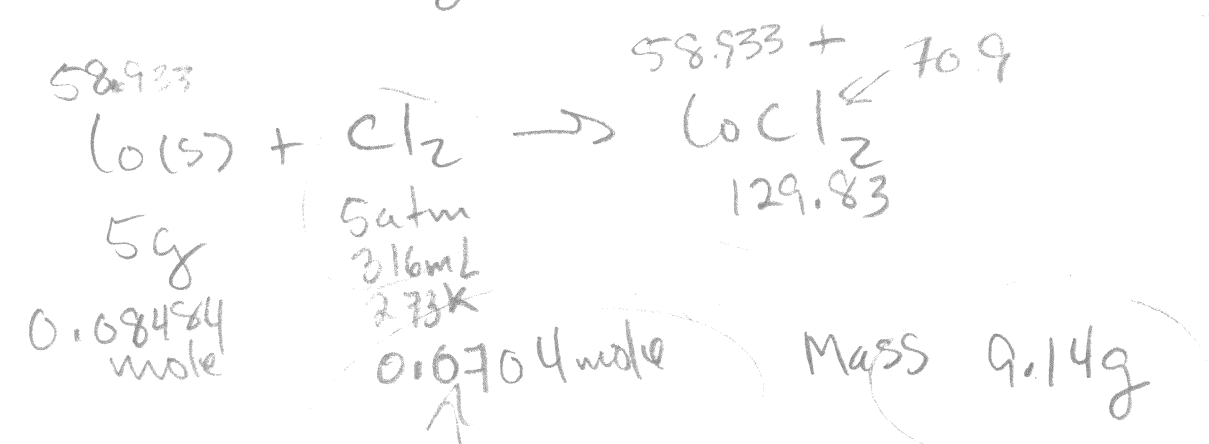
- a) Bal eq
- b) calc L.R + mass product
- * c) ← mass remaining write ionization equation for Co(II) chloride.

27

① write EC for Co and Cl

② which is it easier to remove an e⁻, Co or Cl? why? Co is hft of Cl and has lower I.A.

~~18~~ ~~10~~ ~~10~~



Mass remain = 0.851g Co

21

8.3 L of H_2 at STP are produced. Calc mass Mg used to make the H_2 gas by:



$$8.3 \text{ L } H_2 \times \frac{1 \text{ mole}}{22.4 \text{ L}} = 0.37 \text{ mole } H_2 \times \frac{1 \text{ Mgr}}{1 H_2} =$$

$$= 0.37 \text{ mole Mg}$$

$$\times 24.3 =$$

$$= 9 \text{ g Mg}$$

22

How many moles of O_2 are needed to produce 0.64 mole CO_2 in:



$$0.64 \text{ mole } CO_2 \times \frac{5O_2}{3CO_2} = 1.07 \text{ moles } O_2$$

473

0.842 atm

23

Calc V of Ar gas at $200^\circ C$ and 640 torr given 10g Ar. $PM_m = \rho RT$

$$\left(\frac{\text{g}}{\text{mole}} \right) \left(\frac{\text{mole}}{\text{L}} \right)$$

$$\frac{\text{L} \cdot \text{atm}}{\text{mole} \cdot \text{K}} \times$$

$$\rho = \frac{PM_m}{RT} = \frac{(0.842 \text{ atm})(39.95)}{R(473)}$$

$$\rho = 0.8663 \frac{\text{g}}{\text{L}}$$

$$\frac{10 \text{ g}}{V} = 0.8663; \quad V = \frac{10 \text{ g}}{0.8663 \frac{\text{g}}{\text{L}}} = 11.54 \text{ L}$$

write the complete ionic
equation and net ionic equation
for:

24



16 why are group 8 atoms unreactive.

~~17~~ EC is full

~~18~~ Formulas for ammonia and ammonium



~~19~~ 26 which of following is not a Lewis structure?



24 Name

~~21~~ ~~22~~

25

