

(A)

(i) ? g C in 1.2359 g

The amount of C in CO_2 + CHNO is the same. We do not know Ratios in CHNO \therefore use CO_2

$$\left(\frac{2.241 \text{ g CO}_2}{1} \right) \left(\frac{1 \text{ mole CO}_2}{44.01 \text{ g CO}_2} \right) \left(\frac{1 \text{ mole C}}{1 \text{ mole CO}_2} \right) \left(\frac{12.01 \text{ g C}}{1 \text{ mole C}} \right) = 0.6116 \text{ g C}$$

(ii) mass% N = 28.84% ? g N in 1.2359 g

$$(1.2359 \text{ g CHNO}) (0.2884 \text{ N}) = 0.3564 \text{ g N}$$

(iii) ? g O in 1.2359 g

1.2359 g CHNO

- 0.6116 g C

- 0.3564 g N

- 0.0648 g H

= 0.2031 g O

(iv) Empirical Formula?

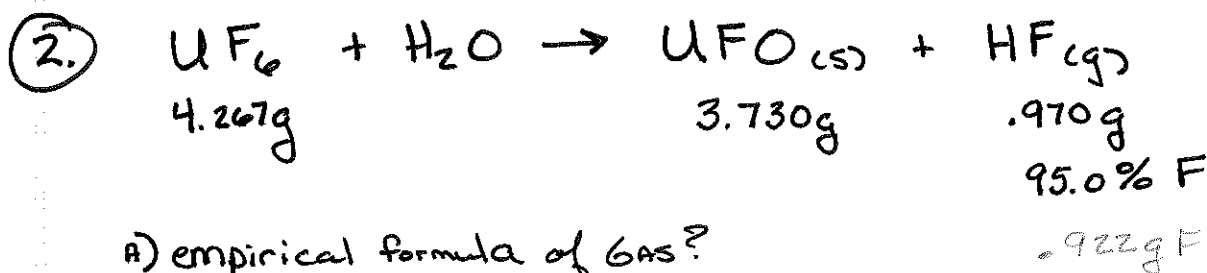
$$\left(\frac{0.6116 \text{ g C}}{1} \right) \left(\frac{1 \text{ mole C}}{12.01 \text{ g C}} \right) = 0.05092 \text{ mole C} \Rightarrow 4 \text{ C}$$

$$\left(\frac{0.3564 \text{ g N}}{1} \right) \left(\frac{1 \text{ mole N}}{14.01 \text{ g N}} \right) = 0.02544 \text{ mole N} \Rightarrow 2 \text{ N}$$

$$\left(\frac{0.0648 \text{ g H}}{1} \right) \left(\frac{1 \text{ mole H}}{1.008 \text{ g H}} \right) = 0.0643 \text{ mole H} \Rightarrow 5 \text{ H}$$

$$\left(\frac{0.2031 \text{ g O}}{1} \right) \left(\frac{1 \text{ mole O}}{16.00 \text{ g O}} \right) = 0.01269 \text{ mole O} \Rightarrow 1 \text{ O}$$





A) empirical formula of GAS?

$(.970g) (95.0\% F) = .922g F$

$\left(\frac{.950g F}{1}\right) \left(\frac{1 \text{ mole F}}{19.00g F}\right) = \frac{5.00 \text{ mole F}}{5.00}$

$\left(\frac{5.0g H}{1}\right) \left(\frac{1 \text{ mole H}}{1.008g H}\right) = \frac{5.00 \text{ mole H}}{5.00} \therefore \text{Ratio } 1:1$

HF

or $\left(\frac{.922g F}{1}\right) \left(\frac{1 \text{ mole F}}{19.00g F}\right) = .0485 \text{ mole F}$

$\left(\frac{.970g - .922g F}{1}\right) \left(\frac{1 \text{ mole H}}{1.008g H}\right) = .0476 \text{ mole H} \therefore \text{Ratio } 1:1$

HF

B) Fraction of F (original UF_6) is in UFO & in HF?

1st Amount of F in UF_6 4.267g

$\left(\frac{4.267g UF_6}{1}\right) \left(\frac{1 \text{ mole } UF_6}{352.03g UF_6}\right) \left(\frac{6 \text{ mole F}}{1 \text{ mole } UF_6}\right) \left(\frac{19.00g F}{1 \text{ mole F}}\right)$

$= 1.38g F$

$\frac{F_{gas}}{UF_6} = \frac{.922g F}{1.38g F} = .668 \frac{F_{gas}}{F_{original}}$

\downarrow

$1.38g \text{ Retant F}$

$= .922g \text{ Gas F}$

$.46g \text{ Solid F}$

$\frac{.46g \text{ Gas F}}{1.38g \text{ Retant F}} = .33 \frac{F_{solid}}{F_{original}}$

or Fraction of F in Solid

$1 - .668 = .332$

② c) Formula of UF_2O_2 ? 3.730g Total

4.267g UF_6 original

1.38g F

2.89g U Same on R + F side

- .46g F

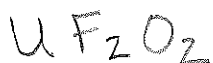
- 2.89g U

2.38g O

$$\left(\frac{2.89g U}{1} \right) \left(\frac{1 \text{ mole U}}{238.03g U} \right) = .0121 \text{ mole U} / .0121 \approx 1$$

$$\left(\frac{0.46g F}{1} \right) \left(\frac{1 \text{ mole F}}{19.00g F} \right) = .024 \text{ mole F} / .0121 \approx 2$$

$$\left(\frac{.38g O}{1} \right) \left(\frac{1 \text{ mole O}}{16.00g O} \right) = .024 \text{ mole O} / .0121 \approx 2$$



D) write balanced Eqn



③ $\text{BeC}_2\text{O}_4(\text{s})$ + Hydrate

A) ? mass % of C in $\text{BeC}_2\text{O}_4 \cdot 3\text{H}_2\text{O}$

Be $1 \times 9.01 = 9.01 \text{ g}$

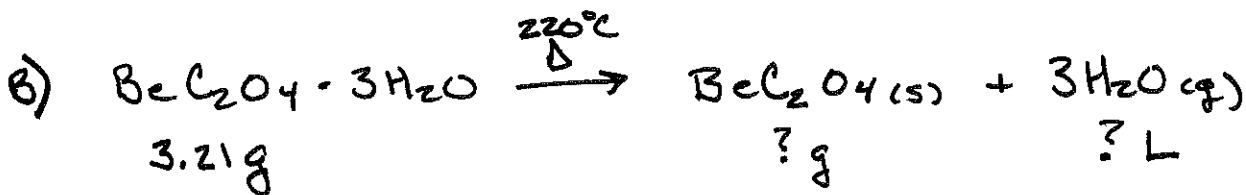
C $2 \times 12.01 = 24.02 \text{ g}$

O $4 \times 16.00 = 64.00 \text{ g} / 97.03 \text{ g BeC}_2\text{O}_4$

$3\text{H}_2\text{O}$ $3 \times 18.02 = 54.06 \text{ g}$

$\underline{\hspace{1cm}}$
 $151.09 \text{ g BeC}_2\text{O}_4 \cdot 3\text{H}_2\text{O}$

$\frac{24.02 \text{ g C}}{151.09 \text{ g BeC}_2\text{O}_4 \cdot 3\text{H}_2\text{O}} \times 100 = 15.90 \% \text{ C}$



@ 220°C , 735 mm Hg

$\left(\frac{3.21 \text{ g BeC}_2\text{O}_4 \cdot 3\text{H}_2\text{O}}{1} \right) \left(\frac{1 \text{ mole BeC}_2\text{O}_4 \cdot 3\text{H}_2\text{O}}{150.09 \text{ g BeC}_2\text{O}_4 \cdot 3\text{H}_2\text{O}} \right) \left(\frac{1 \text{ mole BeC}_2\text{O}_4}{1 \text{ mole BeC}_2\text{O}_4 \cdot 3\text{H}_2\text{O}} \right)$

$\left(\frac{97.03 \text{ g BeC}_2\text{O}_4}{1 \text{ mole BeC}_2\text{O}_4} \right) = 2.06 \text{ g BeC}_2\text{O}_4(\text{s})$

$PV = nRT$

$V = ?$

$P = \left(735 \text{ mm Hg} \right) \left(\frac{1 \text{ atm}}{760 \text{ mm Hg}} \right) = .967 \text{ atm}$

$R = .08206 \frac{\text{L atm}}{\text{mole K}}$

$T = 220^\circ\text{C} + 273 = 493 \text{ K}$

$n = \frac{3.21 \text{ g R}}{2.06 \text{ g BeC}_2\text{O}_4} \left(\frac{1.15 \text{ g H}_2\text{O}}{1} \right) \left(\frac{1 \text{ mole H}_2\text{O}}{18.02 \text{ g H}_2\text{O}} \right) = .0638 \text{ mole H}_2\text{O}$

16.00
 2.016
 18.02

③ B) conti

$$V = \frac{nRT}{P} = \frac{(1.0638 \text{ mole H}_2\text{O}) \left(0.08206 \frac{\text{L atm}}{\text{mole K}} \right) (493 \text{ K})}{.967 \text{ atm}}$$

$$V = 2.67 \text{ L}$$