

KEY

chapter 3 practice test B

1. A 0.200-g sample of a compound containing only carbon, hydrogen, and oxygen is burned, and 0.357 g of CO_2 and 0.146 g of H_2O are collected. What is the percentage of carbon in this compound?
- (A) 56.0%
(B) 73.0%
(C) 48.7%
(D) 24.3%
(E) 43.2%

2. FeCl_3 reacts with hydrogen sulfide (H_2S) to give Fe_2S_3 and hydrogen chloride. How many moles of hydrogen sulfide are required per mole of FeCl_3 ?
- A. 0.5 mol B. 1.0 mol C. 1.5 mol D. 2.0 mol E. 3.0 mol

3. A flask containing 1.00 mol of P_4O_{10} and 1.00 mol of PCl_5 was heated. The following reaction occurred. (Don't forget to balance the equation.) What is the theoretical yield of Cl_3PO ?



- A. 0.60 mol B. 1.67 mol C. 3.33 mol D. 6.00 mol E. 10.0 mol

4. Which of the following has a mass of exactly 3 grams?

- A. 0.25 moles of $^{12}_6\text{C}$ atoms C. 1.5 moles of H_2
B. 0.75 moles of He D. 3 moles of H_2

not a good one
skip

5. Which contains the greatest number of atoms?

- A. 1 g of argon (Ar) D. 1 g of zinc (Zn)
B. 1 g of iron (Fe) E. 1 g of silver (Ag)
C. 1 g of uranium (U)

6. _____

Lycopene, the red-orange pigment in tomatoes, has an empirical formula of C_5H_7 and a molecular weight of more than 450. What is the molecular formula of lycopene?

A. $C_{30}H_{42}$

B. $C_{40}H_{49}$

C. $C_{40}H_{56}$

D. $C_{42}H_{49}$

E. $C_{45}H_{70}$

7. _____

Tungsten (W) reacts with F_2 to give a compound that is 61.73% tungsten. What is the empirical formula of this compound?

A. WF_2

B. WF_3

C. WF_4

D. WF_5

E. WF_6

8. _____

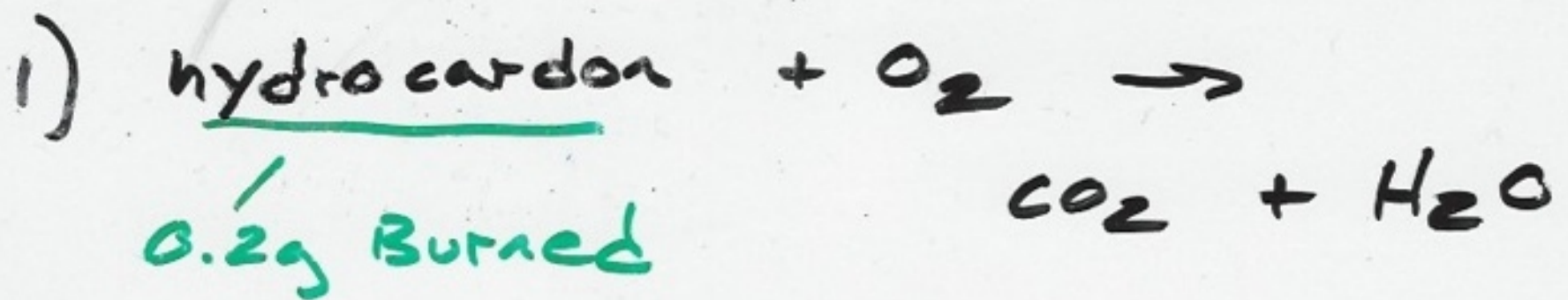
On being burned in air, a 0.2607 g sample of caffeine yielded 0.4732 g of CO_2 . Which of the following is the elemental composition of caffeine?

	C	H	N	O
A.	49.5%	5.2%	28.8%	16.5%
B.	55.5%	6.2%	24.8%	13.5%
C.	61.5%	7.2%	20.8%	10.5%
D.	67.5%	8.2%	16.8%	7.5%
E.	73.5%	9.2%	12.8%	4.5%

~~0.4732g CO~~

$$0.4732g CO_2 \times \frac{12g C}{44g CO_2} = 0.129g C$$
$$\frac{0.129g C}{0.2607}$$

$$\times 100 = 49.5\%$$

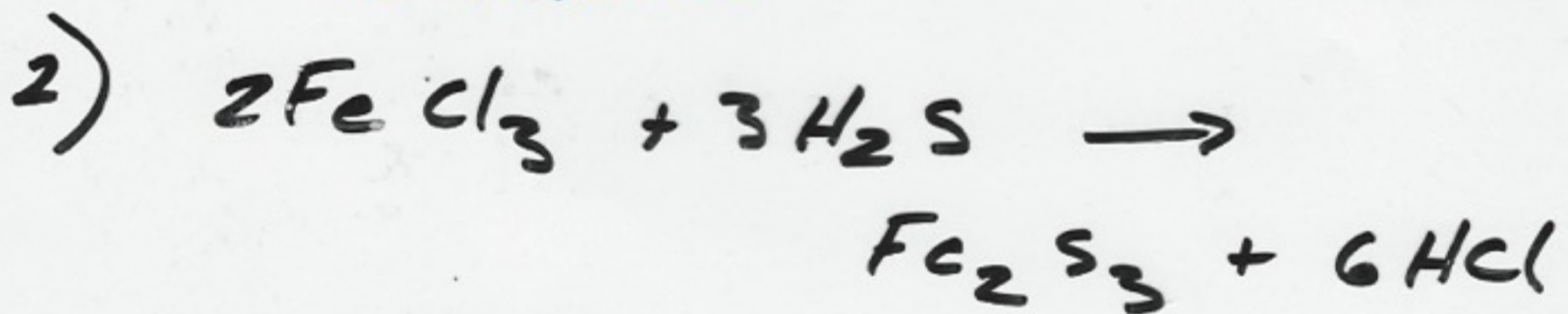


$$0.357g \text{ CO}_2 \times \frac{12g \text{ C}}{44g \text{ CO}_2} = \frac{0.0977g \text{ C}}{0.2g} \times 100$$

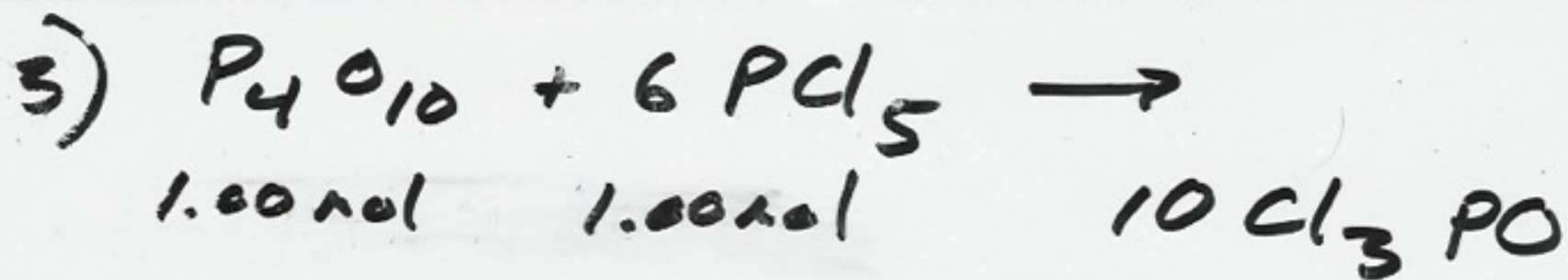
$$0.146g \text{ H}_2\text{O} \times \frac{2g \text{ H}}{18g \text{ H}_2\text{O}} = \frac{0.0162g \text{ H}}{0.2g} \times 100$$

48.5% C

8.11% H



$$\frac{3\text{mol H}_2\text{S}}{2\text{mol FeCl}_3} = \frac{1.5\text{mol H}_2\text{S}}{1\text{mol FeCl}_3}$$



$$1 \text{ mol P}_4\text{O}_{10} \times \frac{6 \text{ mol PCl}_5}{1 \text{ mol P}_4\text{O}_{10}} = 6 \text{ mol PCl}_5$$

If I have I need
 1.00 mol PCl₅ L.R.

$$1.00 \text{ mol PCl}_5 \times \frac{10 \text{ mol Cl}_3\text{PO}}{6 \text{ mol PCl}_5} = 1.67 \text{ mol Cl}_3\text{PO}$$

theoretically

$$4) \quad 0.25 \text{ mol } ^{12}\text{C} \times \frac{12 \text{ g}}{1 \text{ mol}} = 3 \text{ g } ^{12}\text{C}$$

exactly

$$5) \quad 1 \text{ g Ar} \times \frac{1 \text{ mol Ar}}{40 \text{ g}} = \text{most moles}$$

smallest denominator

6) C_5H_7

$$\frac{536g}{67g} = 8$$

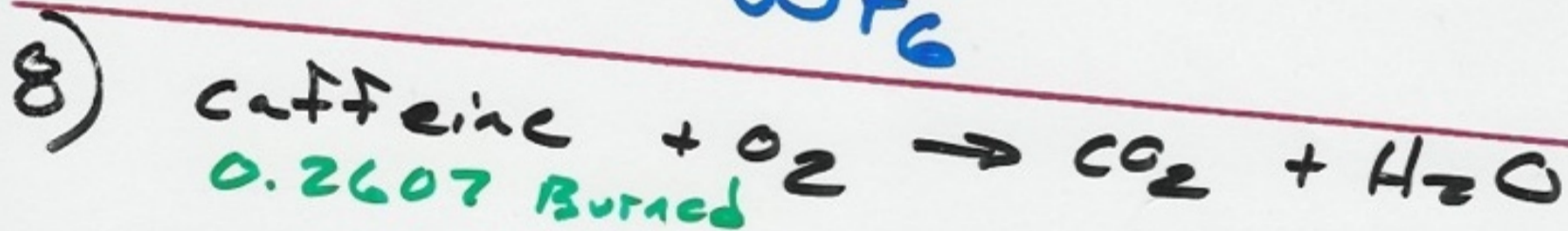
More than 450

$C_{40}H_{56}$

7) $61.73g W \times \frac{1mol}{183.84g} = 0.335mol$

$$38.27g F \times \frac{1mol}{19g} = \frac{2.01mol}{0.335mol} = 6$$

WF_6



$$0.4732g CO_2 \times \frac{12g C}{44g CO_2} = 0.129g C$$
$$\frac{0.129g C}{0.2607} \times 100$$

49.5% C

