

1. If matter is uniform throughout and cannot be separated into other substances by physical processes, but can be decomposed into other substances by chemical processes, it is called a (an)
- A) heterogeneous mixture B) element C) homogeneous mixture D) compound E) mixture of elements
2. Give the correct number of significant figures for the following mathematical operation $(2.50 - 0.100) / 1.10$
- A) 2.2 B) 2. C) 2.18 D) 2.182 E) 2.1818
3. Convert 1000 ft/hr to m/s ? (1ft = 0.3048 m, 1hr = 3600 s)
- A) 0.007060 B) 0.02450 C) 0.08467 D) 0.00106 E) 0.01220
4. The name of the following compound V_2O_3 is
- A) vanadium (III) oxide B) vanadium oxide C) vanadium (II) oxide D) vanadium (III) trioxide E) divanadium trioxide
5. What is the coefficient of HNO_3 when the following equation is properly balanced with the smallest set of whole numbers :-
- $$Cu(s) + HNO_3(aq) \rightarrow Cu(NO_3)_2(aq) + NO(g) + H_2O(l)$$
- A) 3 B) 8 C) 6 D) 12 E) 4
6. How many moles of Na_2SO_4 are contained in a 35.0-g sample of this substance ?
- A) 0.292 mol B) 0.990 mol C) 0.278 mol D) 2.16 mol E) 0.246 mol
7. A 2.50 g of $C_7H_6O_3$ (138.12 g/mol) is reacted with 10.31 g of CH_3OH (32.04 g/mol) according to the following reaction: $C_7H_6O_3 + CH_3OH \rightarrow C_8H_8O_3 + H_2O$. The yield of $C_8H_8O_3$ (152.14 g/mol) is 1.27 g. What is the percentage yield $C_8H_8O_3$
- A) 46.1% B) 32.4% C) 75.0% D) 71.3% E) 23.05%
8. What is the mass of one atom of zinc in grams ? ($N_A = 6.022 \times 10^{23}$)
- A) 6.35×10^{-22} B) 3.20×10^{-22} C) 5.89×10^{-22} D) 1.09×10^{-22} E) 4.05×10^{-22}
9. An organic compound contains by mass. Its composition is 68.85% C, 4.95% H, 26.2% O, and its molecular weight is 122.12 g/mol. What is its molecular formula ?
- A) $C_4H_8O_2$ B) $C_7H_6O_2$ C) $C_{18}H_{28}O_2$ D) $C_{25}H_{12}O_2$ E) $C_{18}H_{36}O_2$
10. How many moles of C_3H_8 that contain 3.17×10^{25} of hydrogen atoms ? ($N_A = 6.022 \times 10^{23}$)
- A) 8.22 mol B) 6.58 mol C) 1.03 mol D) 3.09 mol E) 9.73 mol
11. Which one of the following substances is a weak electrolyte ?
- A) Ne B) NaOH C) NH_3 D) $C_6H_{12}O_2$ E) CH_3OH
12. Which of the following is an oxidation-reduction reaction ?
- A) $CaCl_2(aq) + FeSO_4(aq)$ B) $Fe(s) + H_2SO_4(aq)$ C) $NaOH(aq) + HC_2H_3O_2(aq)$
 D) $(NH_4)_2SO_4(aq) + CaCl_2(aq)$ E) $Mg(NO_3)_2(aq) + CsBr(aq)$
13. The net ionic equation for the reaction between aqueous NH_3 and HBr is
- A) $HBr + NH_3 \rightarrow NH_4Br$ B) $H^+ + OH^- \rightarrow H_2O$ C) $HBr + OH^- \rightarrow Br^- + H_2O$
 D) $H^+ + NH_3 \rightarrow NH_4^+$ E) $H^+ + Br^- + NH_3 \rightarrow NH_4^+ + Br^-$
14. An excess of Na_2CO_3 was added to a 100.0-ml sample of the water containing Pb ions. The mass of $PbCO_3$ (267.2 g/mol) that precipitated was 0.1443 g. What was the mass of Pb^{2+} (207.2 g/mol) in the original sample ?
- A) 0.1120 g B) 11.80 g C) 0.3855 g D) 0.001443 g E) 185.1 g
15. If you have 25.0 ml of 13.5 M HNO_3 solution. What is the final concentration when diluted to 500. ml ?
- A) 0.270 M B) 1.48 M C) 0.958 M D) 0.439 M E) 0.675 M

10001010
01010001
10001010



$\sin x$



2022

نتیجہ

Answers :-

- 1. D
- 2. C
- 3. C
- 4. A
- 5. B

- 6. E
- 7. A
- 8. D
- 9. B
- 10. B

- 11. C
- 12. B
- 13. D
- 14. A
- 15. E



$$\frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

• mixtures
 ↳ hetero ↳ homo

(1) لا يمكن
 cannot be separated
 by physical
 process

عنصري بطل عن element , compound
 ↳
 cannot broken down
 into simpler
 substances by chemical
 process

بالسؤال
 مذکور انه
 (يمكن تقسيمه من
 خلال العمليات الكيميائية)

Compound

(D)

عشان هنك الجواب

2022

(2.50 - 0.100) / 1.10
 2 dn 3 dn

(5)

(2.40 / 1.10)
 3 sig fig 3 sig fig

2.18

(C)

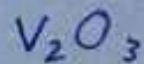
= 2.18

3 sig fig

$1000 \frac{\text{ft}}{\text{hr}} \times \frac{1 \text{ hr}}{3600 \text{ s}} \times \frac{0.3048 \text{ m}}{1 \text{ ft}}$

= 0.08467 (C)

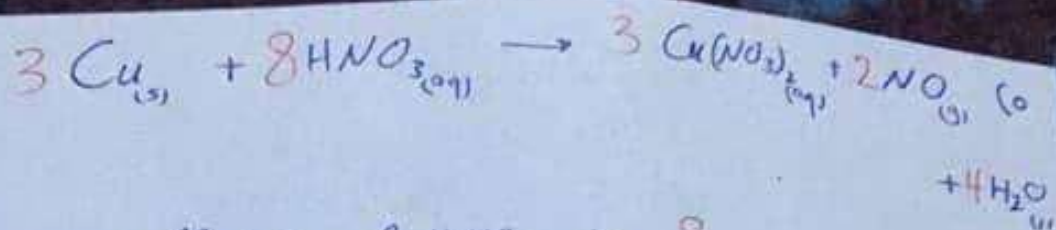
ionic
 compound



Vanadium (III) oxide

Vanadium is a
 transition metal (B)

(A) الجواب



coefficient of HNO_3 is 8

(B) الجواب

Molar mass Na_2SO_4

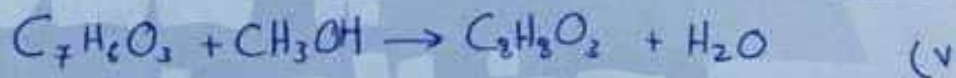
$$= 2 \times 23 + 1 \times 32 + 4 \times 16$$

$$= 142 \text{ g/mol}$$

$$\text{no. of moles} = \frac{\text{mass}}{\text{Molar mass}}$$

$$\text{Na}_2\text{SO}_4 = \frac{35 \text{ g}}{142 \text{ g/mol}} = 0.246 \text{ mol}$$

(E) الجواب



أعطاني معلومتين لمادتين متفاعلات وهذه المعلومات يمكن
 إيجاد عدد المولات منها بالتالي السؤال عن الـ limiting reactant

$$\text{C}_7\text{H}_6\text{O}_3 : n = \frac{2.50 \text{ g}}{138.12 \text{ g/mol}} = 0.018 \text{ mol C}_7\text{H}_6\text{O}_3 \xrightarrow[\text{مولات C}_8\text{H}_8\text{O}_3]{\text{نظما إلى}} 0.018 \text{ mol C}_8\text{H}_8\text{O}_3 \quad (1:1)$$

$$\text{CH}_3\text{OH} : n = \frac{10.31 \text{ g}}{32.04 \text{ g/mol}} = 0.32 \text{ mol CH}_3\text{OH} \xrightarrow[\text{مولات C}_8\text{H}_8\text{O}_3]{\text{نظما إلى}} 0.32 \text{ mol C}_8\text{H}_8\text{O}_3 \quad (1:1)$$

المادة الـ limiting reactant هي $\text{C}_7\text{H}_6\text{O}_3$ بسبب احتوائها على أقل عدد مولات.

$$\text{Theoretical yield (mass of C}_8\text{H}_8\text{O}_3) = \text{moles of C}_7\text{H}_6\text{O}_3 \times \text{Molar mass} = 0.018 \text{ mol} \times 152.14 = 2.74 \text{ g}$$

$$\text{percent yield} = \frac{\text{Actual yield}}{\text{Theoretical yield}} \times 100\% = \frac{1.27}{2.74} \times 100\% = 46.4\%$$

(A) الجواب

$$\text{no. of moles} = \frac{1 \text{ atom Zn}}{(6.023 \times 10^{23})} \quad (n)$$

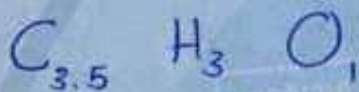
$$= 1.66 \times 10^{-24} \text{ mol Zn}$$

$$\text{mass Zn} = \frac{\text{moles Zn}}{\text{Zn}} \times \frac{\text{Molar mass Zn}}{\text{Zn}}$$

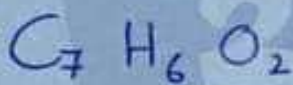
$$= 1.66 \times 10^{-24} \times 65.38$$

$$= 1.08 \times 10^{-22} \text{ g}$$

الجواب (D)



يجب أن تحتوي على أرقام صحيحة.
لذلك نضرب كل ال formula بـ 2



empirical formula

∴ n لا يتعد ال molecular formula نوحد n

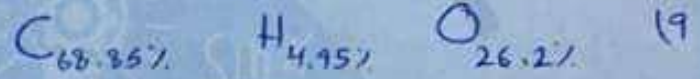
$$n = \frac{\text{M.w of Molecular}}{\text{M.w of empirical}}$$

$$= \frac{122.12}{(7 \times 12 + 6 \times 1 + 2 \times 16)} = 1$$

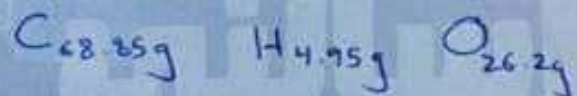
so, empirical formula = molecular formula

الجواب (B)

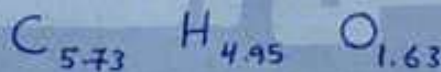
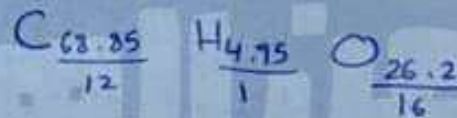
لان n=1



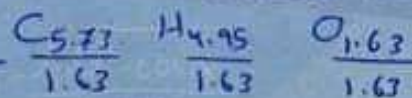
نقرض ان 100g = 100%



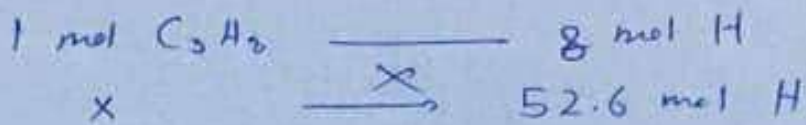
نحول إلى عدد مولات ∴



نقسم على اقل عدد مولات ∴



$$\begin{aligned} \text{no. of moles of H} &= \frac{3.17 \times 10^{25}}{(6.023 \times 10^{23})} \\ &= 52.6 \text{ mol of H} \end{aligned}$$



$$x = \frac{52.6}{8} = 6.58 \text{ mol } C_3H_8$$

الجواب (B)

weak electrolyte \rightarrow NH_3

أو Ne عنصر (element) ولا
يكون تقسيمه لأيونات.

(non electrolytes) $C_6H_{12}O_6$ و CH_3OH أو

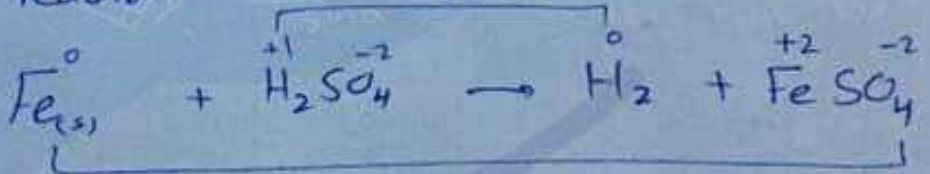
أو $NaOH$ ← strong
- electrolyte

الجواب (C)

(13) كل التفاعلات هي precipitation reaction (تفاعلات ترسيب) بسبب

تفاعل two ionic substances مع بعض والتفاعل (C) هو Acid-base reaction

لذلك التفاعل (B) هو oxidation-reduction reaction



أيضا هو من
أقسام التفاعلات
كما ذكرنا في

دوسية الابداع

في الكيمياء

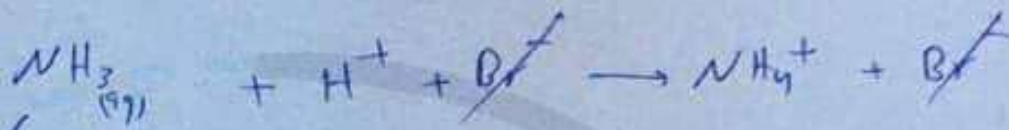
التي تعرفها (redox rxns)

net ionic equation (1W)
for $\text{NH}_3 + \text{HBr}$

molecular equation

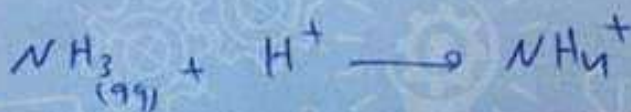


complete ionic equation

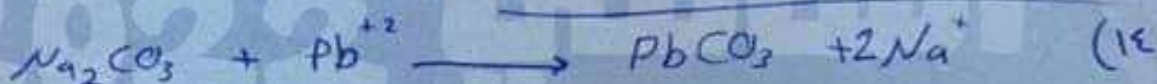


قاعدة لا تتغير
بشكل كبير

net ionic equation



الجواب (D)



$$\text{mass of PbCO}_3 = 0.1443 \text{ g} \longrightarrow \text{no. of moles of PbCO}_3 = \frac{0.1443 \text{ g}}{267.0}$$

$$= 5.4 \times 10^{-4} \text{ mol PbCO}_3$$



$$5.4 \times 10^{-4} \text{ mol PbCO}_3 \longrightarrow x \longrightarrow x = 5.4 \times 10^{-4} \text{ mol Pb}^{2+} \quad (1:1)$$

$$\text{mass of Pb}^{2+} = 5.4 \times 10^{-4} \text{ mol} \times 207.2$$

$$= 0.112 \text{ g Pb}^{2+}$$

الجواب (A)

diluting solution (10

$$M_i \times V_i = M_f \times V_f$$

$$M_f = \frac{M_i \times V_i}{V_f} = \frac{13.5 \times 25 \text{ ml}}{500 \text{ ml}}$$

$$= 0.675 \text{ M}$$

الجواب (E)