

AS Level Chemistry A

H032/01 Breadth in chemistry

MCQ Question Set 1

2.1 Atoms and reactions

Multiple Choice Questions

1. Which ion has a different number of electrons from the other three ions?



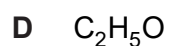
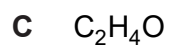
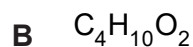
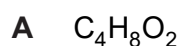
Your answer

[1]

2. An organic compound has the composition by mass:

C, 53.33 %; H, 11.11%; O, 35.56%.

What is the empirical formula of the organic compound?

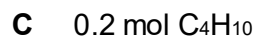
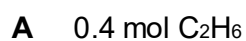


Your answer

[1]

3. Samples of four hydrocarbons are completely burnt under the same conditions of temperature and pressure.

Which sample produces the greatest volume of CO_2 ?



Your answer

[1]

4. Which reaction produces the smallest atom economy of BaCl_2 ?

- A $\text{BaCl}_2 \cdot 2\text{H}_2\text{O} \rightarrow \text{BaCl}_2 + 2\text{H}_2\text{O}$
- B $\text{BaO} + 2\text{HCl} \rightarrow \text{BaCl}_2 + \text{H}_2\text{O}$
- C $\text{BaCO}_3 + 2\text{HCl} \rightarrow \text{BaCl}_2 + \text{CO}_2 + \text{H}_2\text{O}$
- D $\text{Ba} + 2\text{HCl} \rightarrow \text{BaCl}_2 + \text{H}_2$

Your answer

[1]

5. The burette readings from a titration are shown below.

Final reading / cm^3	24.95
Initial reading / cm^3	5.00

The burette used has an uncertainty of $\pm 0.05 \text{ cm}^3$ in each reading.

What is the percentage uncertainty of the resulting titre?

- A 0.20%
- B 0.25%
- C 0.45%
- D 0.50%

Your answer

[1]

6. The electron configuration of element X is: $1s^2 2s^2 2p^6 3s^2 3p^4$

What is the formula of a compound formed when sodium reacts with element X?

- A NaX
- B NaX_2
- C Na_2X
- D Na_2X_3

Your answer

[1]

7. What is the number of oxygen atoms in 88.0 g of CO₂?

- A 3.01×10^{23}
- B 1.20×10^{24}
- C 2.41×10^{24}
- D 4.82×10^{24}

Your answer

[1]

8. A compound has the composition by mass: H, 5.00%; N, 35.00%; O, 60.00%.

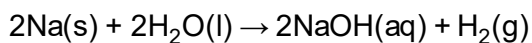
Which compound has this composition?

- A HNO₃
- B NH₄NO₃
- C HNO₂
- D NH₂OH

Your answer

[1]

9. Sodium reacts with water as shown below.



Which mass of sodium reacts with water to produce 960 cm³ of hydrogen gas at RTP?

- A 0.46 g
- B 0.92 g
- C 1.84 g
- D 3.68 g

Your answer

[1]

10. Which equation does **not** represent a neutralisation reaction?

- A $\text{Zn} + 2\text{HCl} \rightarrow \text{ZnCl}_2 + \text{H}_2$
- B $2\text{NH}_3 + \text{H}_2\text{SO}_4 \rightarrow (\text{NH}_4)_2\text{SO}_4$
- C $\text{Na}_2\text{CO}_3 + 2\text{CH}_3\text{COOH} \rightarrow 2\text{CH}_3\text{COONa} + \text{CO}_2 + \text{H}_2\text{O}$
- D $\text{CuO} + 2\text{HNO}_3 \rightarrow \text{Cu}(\text{NO}_3)_2 + \text{H}_2\text{O}$

Your answer

[1]

11. What is the oxidation number of Fe in K_2FeO_4 ?

- A +4
- B +5
- C +6
- D +7

Your answer

[1]

12. Which reaction shows oxidation of sulfur?

- A $2\text{HBr} + \text{H}_2\text{SO}_4 \rightarrow \text{SO}_2 + 2\text{H}_2\text{O} + \text{Br}_2$
- B $\text{SO}_2 + 2\text{NaOH} \rightarrow \text{Na}_2\text{SO}_3 + \text{H}_2\text{O}$
- C $8\text{HI} + \text{H}_2\text{SO}_4 \rightarrow 4\text{I}_2 + \text{H}_2\text{S} + 4\text{H}_2\text{O}$
- D $\text{H}_2\text{S} + \text{Cl}_2 \rightarrow 2\text{HCl} + \text{S}$

Your answer

[1]

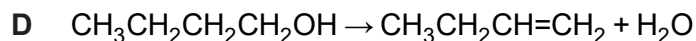
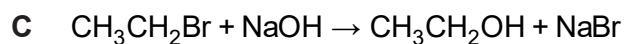
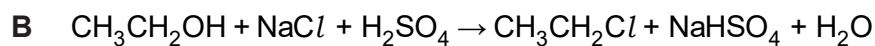
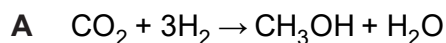
13. What is the percentage composition by mass of nitrogen in $(\text{NH}_4)_2\text{CO}_3$?

- A 14.58%
- B 17.95%
- C 29.17%
- D 37.50%

Your answer

[1]

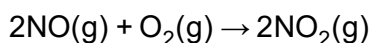
14. Which chemical process is the most sustainable in terms of the atom economy of the organic product?



Your answer

[1]

15. 8.0 dm³ of NO is mixed with 6.0 dm³ of O₂ at room temperature and pressure (RTP). The reaction below takes place until one of the reactants is used up.



What is the volume of the mixture at RTP after the reaction has taken place?

A 8.0 dm³

B 10.0 dm³

C 12.0 dm³

D 14.0 dm³

Your answer

[1]

16. What is the volume of 0.0100 mol of N₂ at 350 °C and 200 kPa?

A 145 cm³

B 259 cm³

C 145 dm³

D 259 dm³

Your answer

[1]

17. 0.24 g of an element, **X**, is reacted with 0.0100 mol Cl_2 to form a chloride with the formula XCl_2 .

What is element **X**?

- A carbon
- B magnesium
- C molybdenum
- D titanium

Your answer

[1]

18. A phosphate(V) ion has the formula PO_4^{3-} .

What is the formula for copper(I) phosphate(V)?

- A $\text{Cu}(\text{PO}_4)_5$
- B Cu_5PO_4
- C $\text{Cu}(\text{PO}_4)_3$
- D Cu_3PO_4

Your answer

[1]

19. Which reaction shows chlorine only being oxidised?

- A $\text{Cl}_2 + \text{H}_2\text{O} \rightarrow \text{HCl} + \text{HClO}$
- B $2\text{ClO}_2 + 2\text{NaOH} \rightarrow \text{NaClO}_2 + \text{NaClO}_3 + \text{H}_2\text{O}$
- C $4\text{KClO}_3 \rightarrow 3\text{KClO}_4 + \text{KCl}$
- D $\text{MnO}_2 + 4\text{HCl} \rightarrow \text{MnCl}_2 + \text{Cl}_2 + 2\text{H}_2\text{O}$

Your answer

[1]

Total Marks for Question Set 1: 19

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