O Level Pure Chemistry MCQs

The Mole Concept and Stoichiometry Test 1.0
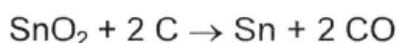
Q1

Which substance contains the most number of molecules in 1 g?

A O_2
B CO
C NO_2
D SO_2

Q2

Tin is extracted from its ore cassiterite (which contains SnO_2) by reduction by carbon in a blast furnace according to the equation below.

$$SnO_2 + 2\,C \rightarrow Sn + 2\,CO$$

What is the percentage purity of tin ore if 600g of cassiterite on reduction produces 82g of tin? (M_r of SnO_2 = 151, M_r of Sn = 119)

A $\frac{82}{119} \times \frac{600}{151} \times 100\%$

B $\frac{82}{119} \times \frac{151}{600} \times 100\%$

C $\frac{119}{82} \times \frac{600}{151} \times 100\%$

D $\frac{119}{82} \times \frac{151}{600} \times 100\%$

Q3

12.0 g of anhydrous magnesium sulfate combines with 12.6 g of water to form hydrated magnesium sulfate.

What is the formula of hydrated magnesium sulfate?

A $MgSO_4 \cdot 3H_2O$
B $MgSO_4 \cdot 5H_2O$
C $MgSO_4 \cdot 7H_2O$
D $MgSO_4 \cdot 9H_2O$

Q4

Five students each dissolved an indigestion tablet in 100 cm³ of water. They titrated 25.0 cm³ of their solutions with dilute hydrochloric acid using the same indicator. The results are shown in the table.

student	A	B	C	D	E
volume of dilute hydrochloric titrated / cm³	19.4	19.5	19.4	19.6	21.0

Which statement could explain the anomalous result obtained by student E?

A   The pipette was washed out with tablet solution.
B   The burette was washed out with hydrochloric acid.
C   The titration flask was washed out with the tablet solution.
D   The titration flask was washed out with hydrochloric acid.

Q5

A hydrocarbon compound contains 86% carbon and 14% hydrogen by mass. The likely molecular formula is

A CH_4
B C_4H_8
C C_6H_6
D C_8H_{18}

Q6

If x electrons are needed to deposit 108 g of silver from a solution containing silver ions, how many electrons are needed to deposit 27 g of aluminium from a solution containing aluminium ions?

A   x
B   2x
C   3x
D   4x

Q7

1   Dilute sulfuric acid was added to aqueous barium hydroxide until the acid was in excess. Which graph best represents the variation in the *total number of ions in solution*?

A   B   C   D

2
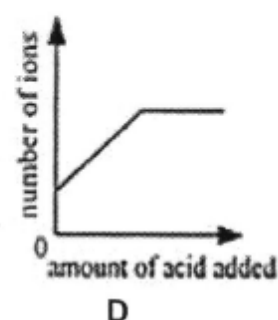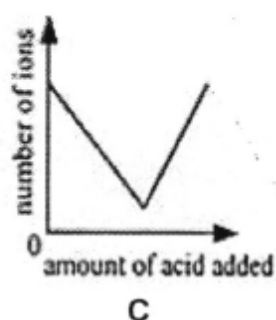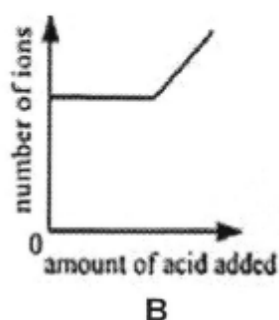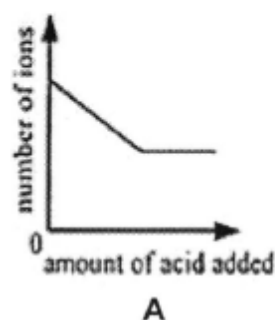
Q8

Shakudo is a Japanese alloy of copper and gold. The information in the table was obtained by mass spectrometry of a sample of shakudo.

mass number	63	65	197
% abundance	65	29	6

What is the average relative atomic mass of copper?

A 59.8   **B** 63.5   **C** 63.6   **D** 71.6

Q9

A mass of 10.4 g of magnesium nitrate is completely thermally decomposed. The products are magnesium oxide and a mixture of two gases.
One gas is acidic while the other gas is neutral. The equation below shows the reaction.

$$2Mg(NO_3)_2 \rightarrow 2MgO + 4NO_2 + O_2$$

What is the mass of the neutral gas formed?

A 1.12 g   **B** 1.93 g   **C** 2.24 g   **D** 6.45 g

Q10

An element forms a diatomic molecule, **P**, which has a relative molecular mass, **x**. The Avogadro constant is **L**.

How many atoms are present in 1.0 g of **P**?

A $\dfrac{L}{x}$ **B** $\dfrac{2L}{x}$

C $\dfrac{L}{2x}$ **D** $2Lx$

Answers

The Mole Concept and Stoichiometry Test 1.0

Q1 B

Q2 B

Q3 C

Q4 C

Q5 B

Q6 C

Q7 C

Q8 C

Q9 A

Q10 B