

Self-test Questions

Topic 1 (SL)

- 1 What is the mass of 0.100 mol C₂H₅OH?
Relative atomic masses: H = 1.01, C = 12.01, O = 16.00
A 3.4 g
B 461 g
C 4.61 g
D 46.1 g
- 2 How many moles of H atoms are present in 9.01 g of H₂O?
Relative atomic masses: H = 1.01, O = 16.00
A 0.500
B 1.00
C 2.00
D 6.02×10^{23}
- 3 Which of the following contains the largest number of O atoms?
Relative atomic masses: C = 12.01, N = 14.01, O = 16.00, S = 32.07
A 0.50 mol CO₂
B 8.0 g O₂
C 16 g SO₂
D 0.20 mol N₂O₄
- 4 1.00 kg of which of the following contains the largest number of molecules?
Relative atomic masses: N = 14.01, O = 16.00, S = 32.07
A N₂O
B NO
C SO₂
D SO₃
- 5 0.15 mol copper react with nitric acid according to the equation:
 $3\text{Cu} + 8\text{HNO}_3 \rightarrow 3\text{Cu}(\text{NO}_3)_2 + 4\text{H}_2\text{O} + 2\text{NO}$
How many moles of NO are formed?
Relative atomic masses: H = 1.01, N = 14.01, O = 16.00, Cu = 63.55
A 0.23 mol
B 0.10 mol
C 0.15 mol
D 0.30 mol
- 6 Phosphorus(III)chloride may be prepared from phosphorus and chlorine:
 $\text{P}_4 + 6\text{Cl}_2 \rightarrow 4\text{PCl}_3$
When 0.124 g of phosphorus were reacted with excess chlorine, 0.120 g of PCl₃ were formed. What was the yield of PCl₃?
Relative atomic masses: P = 30.97, Cl = 35.45
A 96.8%
B 90.2%
C 22.6%
D 5.63%

7 NaClO_3 decomposes when heated via the formation of NaClO_4 :



What is the maximum number of moles of oxygen that can be produced when 0.200 mol NaClO_3 are heated?

Relative atomic masses: O = 16.00, Na = 22.99, Cl = 35.45

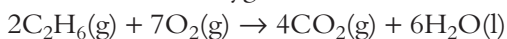
A 0.300 mol

B 0.900 mol

C 0.100 mol

D 0.133 mol

8 Ethane burns in oxygen:



What volume of carbon dioxide (measured at STP) is formed when 0.301 g of ethane are burnt in excess oxygen?

Relative atomic masses: H = 1.01, C = 12.01, O = 16.00

Molar volume of an ideal gas at STP = $22.7 \text{ dm}^3 \text{ mol}^{-1}$

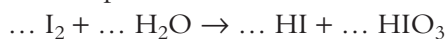
A 0.454 cm^3

B 454 cm^3

C 227 cm^3

D 909 cm^3

9 What is the sum of the coefficients when the following equation is balanced using the smallest possible whole numbers?



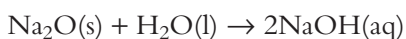
A 4

B 8

C 11

D 12

10 Sodium oxide reacts with water:



What mass of sodium oxide must be used to produce 100.0 cm^3 of a $0.250 \text{ mol dm}^{-3}$ solution of sodium hydroxide?

Relative atomic masses: H = 1.01, O = 16.00, Na = 22.99

A 0.775 g

B 1.55 g

C 0.387 g

D 1.00 g