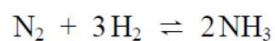


Quantitative Chemistry

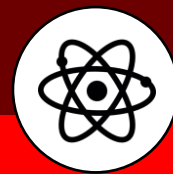
2003

- 9 Ammonia is manufactured from the reaction between nitrogen and hydrogen.



What is the maximum mass of ammonia that can be obtained from a mixture of 56 g of nitrogen with 9 g of hydrogen? (Relative atomic masses: H = 1; N = 14.)

- A 34 g
- B 51 g
- C 65 g
- D 68 g

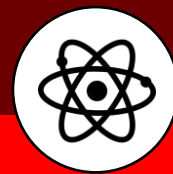


2004

- 8 An oxide of tungsten contains 79.31% by mass of tungsten.

What is the formula of this oxide? (relative atomic masses: O = 16; W = 184)

- A WO
- B W₂O₃
- C WO₂
- D W₃O₄
- E WO₃



2005

- 11 Which fraction is the percentage by mass of water of crystallisation in sodium carbonate decahydrate?

(Relative atomic masses, A_r : Na=23; C=12; O=16; H=1)

A $\frac{18 \times 100}{(23 + 12 + 48 + 180)}$

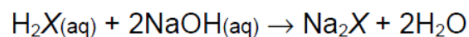
B $\frac{18 \times 100}{(46 + 12 + 48 + 180)}$

C $\frac{180 \times 100}{(23 + 12 + 48 + 18)}$

D $\frac{180 \times 100}{(46 + 12 + 48 + 180)}$

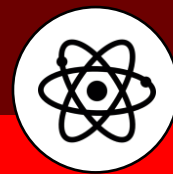
- 19 A sample of an acid, H_2X , weighing 4.5 g was dissolved in water.

This solution was neutralised by 50.0 cm^3 of aqueous sodium hydroxide containing 2 mol/dm^3 .



What is the relative molecular mass, M_r , of the acid?

- A 45
B 90
C 100
D 205



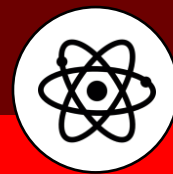
Quantitative Chemistry

- 23 A sample of butane, C_4H_{10} is treated with deuterium, D (an isotope of hydrogen) and some of the hydrogen atoms are replaced by deuterium atoms.

Analysis shows that the substituted butane contains 80.0% of carbon by mass.

Which one of the following is its formula? (A_r : H=1; D=2; C=12)

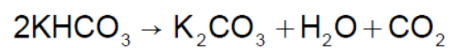
- A C_4H_9D
- B $C_4H_8D_2$
- C $C_4H_7D_3$
- D $C_4H_6D_4$



Quantitative Chemistry

2006

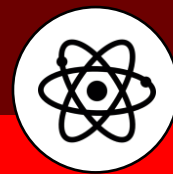
- 13 At 200 °C, potassium hydrogencarbonate decomposes according to the following equation.



What is the loss in mass when 50.0 g of potassium hydrogencarbonate are heated at 200 °C to constant mass?

(A_r : H = 1; C = 12; O = 16; K = 39)

- A 11.0 g
- B 15.5 g
- C 22.0 g
- D 31.0 g



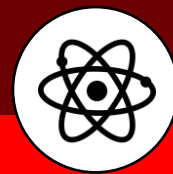
2007

- 18 What volume of steam would be produced from an ice cube of mass 6.00 g if it were heated until it all evaporated?

(A_r values: H = 1; O = 16)

(Take molar volume at room temperature and pressure = 24 dm³)

- A 240 cm³
B 1800 cm³
C 4800 cm³
D 8000 cm³



2008

26 A sample of an alkali XOH of mass 2.8 g was dissolved in water.

This solution was neutralised by 12.5 cm^3 of sulphuric acid of concentration 2.0 mol dm^{-3} .



What is the relative atomic mass of X ?

(A_r : H = 1, O = 16, S = 32)

- A 13
- B 26
- C 39
- D 52
- E 65
- F 78