(Pure substances and mixtures)

Q1.(2018)

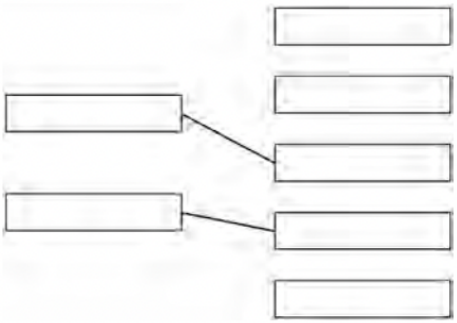
1.6 (g)

Q2.(2018)

$$\frac{0.9}{2.5} \times 100$$

$$= 36\ (\%)$$

Q3.(2018)



Q4.(2019)

evaporate all water from the sample

measure the sample's boiling point

Q5.(2019)

$$\frac{36}{12} \times 8$$

$$= 24\ (g)$$

Q6.(2019)

Plan – allow diagrams to indicate content

- three test tubes containing nails
- test tube 1 – open test tube with water
- test tube 2 – stoppered test tube with drying agent
- test tube 3 – test tube with boiled water
- test tube 3 – sealed with oil
- leave for several days
- observe results

Results

- test tube 1 – nail rusts
- test tube 2 – nail does not rust
- test tube 3 – nail does not rust

Q7.(2020)

systematic error

Q8.a)(2021)

(mass) balance

(volume) measuring cylinder

Q8.b)(2021)

(mass of salt = 30.49 – 30.44 =)
0.05 (g salt)

(mass of salt in 1000 cm^3 =)
$\frac{1000}{50} \times 0.05$

= 1.0 (g)

alternative approach:

(volume ratio = $\frac{1000}{50}$) = 20 (1)

(mass of salt in 1000 cm^3)
= (30.49 – 30.44) × 20 (1)

= 1.0 (g) (1)

Q8.c)(2021)

heat the evaporating dish and salt again

measure the mass of the evaporating dish and salt again

Q9.(2021)

(conversion)

(800 cm^3 $= \frac{800}{1000}$ =) 0.8

(dm^3)

(mass =) 0.8 × 258 (g)

= 206.4 (g)

= 206 (g)

alternative approach:
(conversion)
(258 g/dm^3 $= \frac{258}{1000}$ =) 0.258
(g/cm^3) (1)

(mass =) 0.258 × 800 (g) (1)

= 206.4 (g) (1)

= 206 (g) (1)

Q10.a)(2022)

balance

measuring cylinder

Q10.b)(2022)

$$\text{(mean =)}\ \frac{1.73 + 1.70 + 1.75 + 1.78}{4}$$

= 1.74 (g)

Q10.c)(2022)

$$\text{(mass =)}\ \frac{1.5 \times 1000}{50}$$

= 30 (g)

Q11.(2024)

$$\text{(mean concentration of NaCl =)}\ \frac{35.2 + 34.6 + 36.4 + 33.8}{4}$$

or

$$\frac{140}{4}$$

= 35.0 (g/dm^3)

$$\text{(mean concentration of Na}^+\text{ =)}\ 35.0 \times \frac{39.3}{100}$$

= 13.8 (g/dm^3)

alternative approach 1:

(total concentration of NaCl =
35.2 + 34.6 + 36.4 + 33.8 = 140
total concentration of Na+ =)

$$140 \times \frac{39.3}{100}\ \text{(1)}$$

= 55.02 (g/dm^3) (1)

$$\text{(mean concentration of Na}^+\text{ =)}\ \frac{55.02}{4}\ \text{(1)}$$

=13.8 (g/dm^3) (1)

alternative approach 2:

(concentrations of Na^+ =)

$35.2 \times \frac{39.3}{100}$

$34.6 \times \frac{39.3}{100}$

$36.4 \times \frac{39.3}{100}$

$33.8 \times \frac{39.3}{100}$ (1)

= 13.83 13.60 14.31 13.28 (1)

(mean concentration of Na^+ =)

$$\frac{13.83 + 13.60 + 14.31 + 13.28}{4}$$

(1)

=13.8 (g/dm^3) (1)