

(Flame tests and tests for metal cations (Na^+ , K^+ , Ca^{2+} , Cu^{2+} , etc.))

Q1. (2018)

yellow

Q2. (2018)

copper (ion)

Q3. (2018)

(flame) colours are masked

Q4. a). (2019)

lithium:

- crush tablets or dissolve tablet (in water or acid)
- clean wire
- place on wire
- place in (roaring / blue / non-luminous) flame
- observe flame colour
- crimson flame

carbonate:

- add hydrochloric acid
- effervescence / fizzing
- bubble gas through limewater
- limewater becomes cloudy

Q4. b). (2019)

formulation(s)

Q4. c). (2019)

$$1.20 \text{ g} = 1200 \text{ mg}$$

or

$$700 \text{ mg} = 0.700 \text{ g}$$

$$\frac{700}{1200} \times 100 \text{ or } \frac{0.700}{1.20} \times 100$$

$$= 58.3 (\%)$$

Q5. a). (2019)

add sodium hydroxide (solution
to water sample)

white precipitate (forms)

(precipitate which is) soluble in
excess (NaOH)

Q5. b). (2019)

add barium chloride (solution)
and (dilute) hydrochloric acid (to
water sample)

white precipitate (forms)

Q5. c). (2019)

Indicative content

- weigh (evaporating) basin / dish
- add measured volume of water
- weigh (evaporating) basin / dish and water
- heat to evaporate water
- reweigh
- repeat heating until constant mass obtained
- subtract mass of (evaporating) basin / dish from mass
- repeat and calculate a mean, discarding anomalous results
- calculate the mass in 100 cm^3 water if necessary

Q6. a). (2020)

green

Q6. b). (2020)

did not clean the metal wire
(between tests)

or

copper sulfate (solution) is still
present

(so) colours are mixed / blended
/ masked

Q6. c). (2020)

(copper sulfate solution)
blue precipitate

(calcium iodide solution)
white precipitate

Q6. d). (2020)

barium chloride (solution)

Q6. e). (2020)

silver nitrate (solution)

yellow precipitate

Q7. (2021)

flame test

lilac (flame)

Q8. a). (2021)

white precipitate

Q8. b). (2021)

(add) excess sodium hydroxide
(solution)

precipitate dissolves

Q9. (2022)

sodium hydroxide (solution)

blue precipitate

Q10. a). (2023)

(potassium ions)

- **place sample on (clean metal) wire**
- **introduce into (blue / non-luminous) flame**
- using (Bunsen) burner
- **observe lilac flame colour**
- which shows presence of potassium (ions)

(bromide ions)

- **dissolve sample**
- in (distilled) water
- in test tube
- add (dilute) nitric acid
- **add silver nitrate (solution)**
- using (dropping) pipette
- **observe cream precipitate (formed after addition of silver nitrate solution)**
- which shows presence of bromide (ions)

Q10. b). (2023)

flame emission spectroscopy

Q10. c). (2023)

any **one** from:

- (more) accurate
- (more) sensitive
- fast(er)
- determine the concentration of ions present

Q11. (2023)

(test) (add) sodium hydroxide
(solution)

(result) blue precipitate

OR

(test) flame test (1)

(result) green (flame) (1)

Q12. a). (2024)

(test)
flame test

(result)
yellow (flame)

OR

(test)
flame emission spectroscopy (1)

(result)
lines match sodium spectrum (1)

Q12. b). (2024)

(test)

(add acidified) silver nitrate

(solution)

(result)

white precipitate

Q12. c). (2024)

to ensure that all the water has
evaporated

Q12. d). (2024)

mass of evaporating dish and
dry contents – mass of empty
evaporating dish

Q12. e). (2024)

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

or

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

$$= 35.0 \text{ (g/dm}^3\text{)}$$

(mean concentration of Na^+ =)

$$35.0 \times \frac{39.3}{100}$$

$$= 13.8 \text{ (g/dm}^3\text{)}$$