

The Elements of Groups 1 and 2 - Questions by Topic

Q1.

A colourless solid, Q, was warmed with sodium hydroxide solution. A gas was evolved which turned damp red litmus paper blue. What is solid Q?

(1)

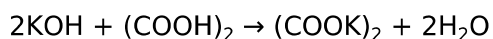
- A NaNO_3
- B NH_4Cl
- C NaCl
- D $\text{Ca}(\text{NO}_3)_2$

(Total for question = 1 mark)

Q2.

Ethanedioic acid is a solid diprotic acid. A student used ethanedioic acid in a titration to find the concentration of a potassium hydroxide solution.

The equation for the reaction is:



(a) Calculate the mass of ethanedioic acid that should be used to make 1000 cm^3 of a $0.0500 \text{ mol dm}^{-3}$ solution in water.

Give your answer to an appropriate number of significant figures.

[Molar mass of ethanedioic acid = 90.0 g mol^{-1}].

(2)

(b) A student decided to check to see if phenolphthalein was a suitable indicator for this titration. The student measured 400 cm^3 of the $0.0500 \text{ mol dm}^{-3}$ ethanedioic acid into a beaker and added a few drops of phenolphthalein indicator.

Calculate the minimum mass of solid potassium hydroxide that should be added to produce a colour change.

(2)

*(c) A student used a $0.0500 \text{ mol dm}^{-3}$ solution of ethanedioic acid to find an accurate concentration of a potassium hydroxide solution which was known to have an approximate concentration of 0.1 mol dm^{-3} .

Describe a procedure to obtain reliable titration results using standard laboratory equipment.

(6)

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

(Total for question = 10 marks)

Q3.

Which statement is **not** explained by hydrogen bonding?

(1)

- A** all Group 1 hydroxides are soluble in water
- B** many simple alcohols are soluble in water
- C** the density of ice is less than the density of liquid water at 0 °C
- D** the melting temperature of water is abnormally high

(Total for question = 1 mark)

Q4.

Compound X gives a red flame test colour and a white precipitate on addition of dilute hydrochloric acid followed by barium chloride solution. Which compound is X?

(1)

- A** calcium chloride
- B** lithium sulfate
- C** potassium sulfate
- D** strontium chloride

(Total for question = 1 mark)

Q5.

Which process explains the flame colour produced by the compounds of Group 1 elements?

(1)

- A** absorption of visible light energy as electrons are promoted to higher energy levels
- B** absorption of visible light energy as electrons are removed from gaseous atoms
- C** emission of visible light energy as electrons return to lower energy levels
- D** emission of visible light energy as electrons are added to gaseous ions

(Total for question = 1 mark)

Q6.

A student made the following statements about trends going **down** Group 2.
Which statement is correct?

(1)

- A** the thermal stability of the nitrates decreases
- B** the thermal stability of the carbonates decreases
- C** the solubility of hydroxides increases
- D** the solubility of sulfates increases

(Total for question = 1 mark)