

GCSE Chemistry B (Twenty First Century Science)
J258/02 Depth in chemistry (Foundation Tier)

Question Set 12

1

Ali does an experiment to find out how the pH changes when he adds dilute sodium hydroxide to dilute sulfuric acid. He puts the dilute acid in a beaker and adds dilute sodium hydroxide, 1.0 cm^3 at a time. He uses a pH meter to measure the pH of the mixture during the reaction, as shown in **Fig. 1.1**.

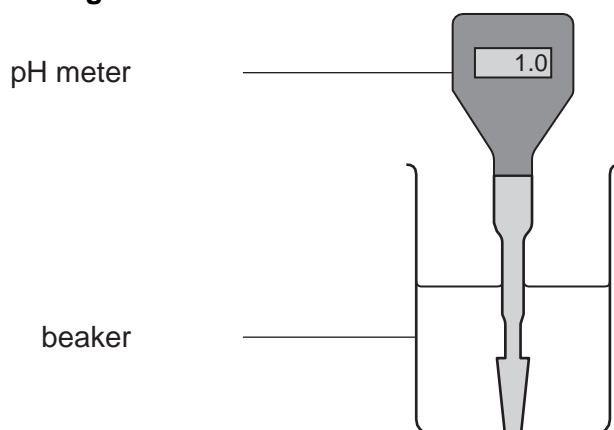


Fig. 1.1

Ali plots a graph of his results, as shown in **Fig. 1.2**.

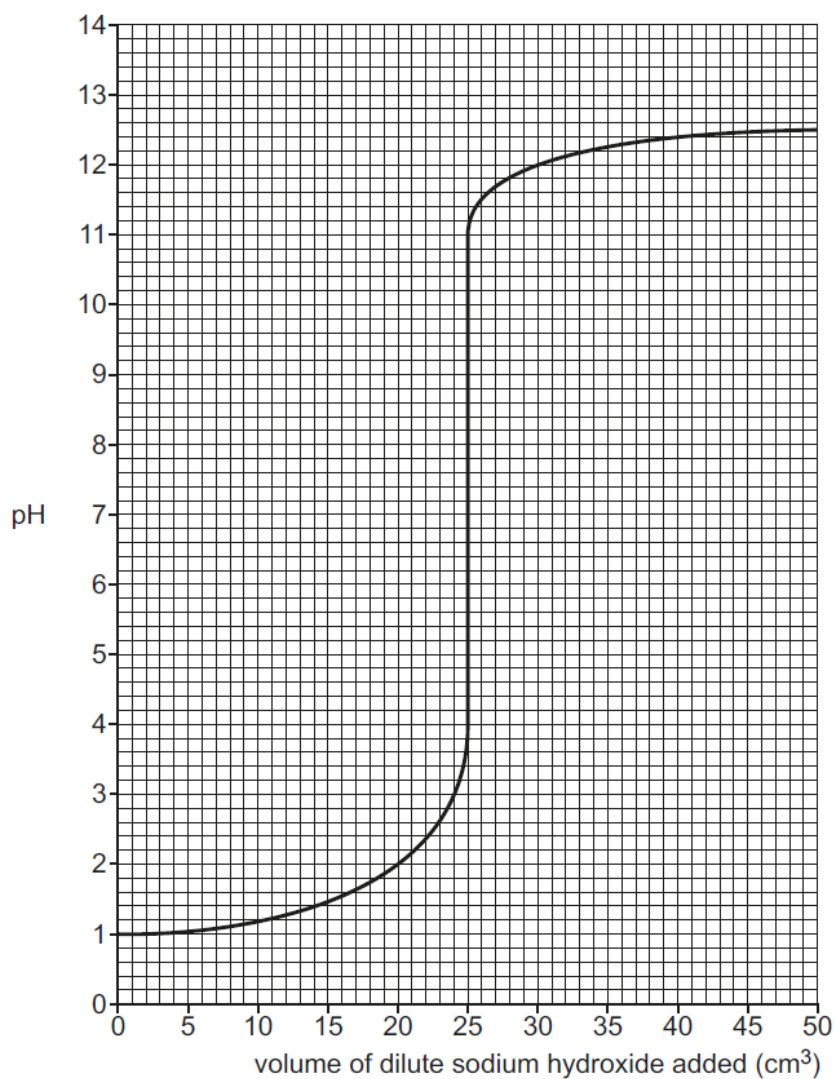


Fig. 1.2

- (a) (i) Use values from the graph in **Fig. 1.2** to describe how the pH changes when dilute sodium hydroxide is added to the acid. [2]
- (ii) Explain why the pH readings at the start, and at the end of the reaction, are different. [2]

(b) Ali writes an equation for the reaction.

- (i) Balance the symbol equation by putting numbers on the dotted lines.



- (ii) Draw lines to connect each **substance** with its correct **formula**.

Substance	Formula
water	NaOH
sodium sulfate	H ₂ SO ₄
sulfuric acid	Na ₂ SO ₄
sodium hydroxide	H ₂ O

[2]

- (c) (i) The reactions of acids with hydroxides can be shown by this general equation.

Complete the word and symbols equations.

hydrogen ions + → water

..... + OH⁻ → [2]

- (ii) What is the name for this type of reaction?

Put a ring around the correct answer.

filtration oxidation precipitation neutralisation [1]

Total Marks for Question Set 12: 10

Resource Materials

The Periodic Table of the Elements

(1)	(2)											(3)	(4)	(5)	(6)	(7)	(0)	
1	2											13	14	15	16	17	18	
1 H hydrogen 1.0																		2 He helium 4.0
3 Li lithium 6.9	4 Be beryllium 9.0											5 B boron 10.8	6 C carbon 12.0	7 N nitrogen 14.0	8 O oxygen 16.0	9 F fluorine 19.0	10 Ne neon 20.2	
11 Na sodium 23.0	12 Mg magnesium 24.3											13 Al aluminium 27.0	14 Si silicon 28.1	15 P phosphorus 31.0	16 S sulfur 32.1	17 Cl chlorine 35.5	18 Ar argon 39.9	
19 K potassium 39.1	20 Ca calcium 40.1	21 Sc scandium 45.0	22 Ti titanium 47.9	23 V vanadium 50.9	24 Cr chromium 52.0	25 Mn manganese 54.9	26 Fe iron 55.8	27 Co cobalt 58.9	28 Ni nickel 58.7	29 Cu copper 63.5	30 Zn zinc 65.4	31 Ga gallium 69.7	32 Ge germanium 72.6	33 As arsenic 74.9	34 Se selenium 79.0	35 Br bromine 79.9	36 Kr krypton 83.8	
37 Rb rubidium 85.5	38 Sr strontium 87.6	39 Y yttrium 88.9	40 Zr zirconium 91.2	41 Nb niobium 92.9	42 Mo molybdenum 95.9	43 Tc technetium	44 Ru ruthenium 101.1	45 Rh rhodium 102.9	46 Pd palladium 106.4	47 Ag silver 107.9	48 Cd cadmium 112.4	49 In indium 114.8	50 Sn tin 118.7	51 Sb antimony 121.8	52 Te tellurium 127.6	53 I iodine 126.9	54 Xe xenon 131.3	
55 Cs caesium 132.9	56 Ba barium 137.3	• 57–71 lanthanoids	72 Hf hafnium 178.5	73 Ta tantalum 180.9	74 W tungsten 183.8	75 Re rhenium 186.2	76 Os osmium 190.2	77 Ir iridium 192.2	78 Pt platinum 195.1	79 Au gold 197.0	80 Hg mercury 200.6	81 Tl thallium 204.4	82 Pb lead 207.2	83 Bi bismuth 209.0	84 Po polonium	85 At astatine	86 Rn radon	
87 Fr francium	88 Ra radium	• 88–103 actinoids	104 Rf rutherfordium	105 Db dubnium	106 Sg seaborgium	107 Bh bohrium	108 Hs hassium	109 Mt meitnerium	110 Ds darmstadtium	111 Rg roentgenium	112 Cn copernicium		114 Fl flerovium		116 Lv livermorium			

<p>Key</p> <p>atomic number</p> <p>Symbol</p> <p>name</p> <p>relative atomic mass</p>

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