Paper Reference(s) 9CH0/01
Pearson Edexcel Level 3 GCE

Chemistry
Advanced
PAPER 1: Advanced Inorganic and Physical Chemistry

Monday 10 June 2024 – Morning

Diagram Booklet

THIS DIAGRAM BOOKLET MUST BE RETURNED WITH THE QUESTION PAPER AT THE END OF THE EXAMINATION.

In the boxes below, write your name, centre number and candidate number.

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Pearson

INSTRUCTIONS

There may be spare copies of some diagrams in case you need them.

CONTENTS

Page

3 Question 1(a)

4 Question 1(b)(i)

5 Question 2(a)

6 Question 2(c)

7 Question 3(b)

8 Question 4(b)

9 Question 4(c)

10 Question 5(a)

11 Question 5(b)(i)

12 Question 8(c)(i)

13 Question 8(c)(iii)

14 Question 9(a)

Spare Copies

15 Question 1(a)

16 Question 1(b)(i)

17 Question 3(b)

18 Question 5(b)(i)

19 Question 8(c)(i)

Question 1(a)

Species	Number of protons	Number of neutrons	Number of electrons
^{32}S			
^{33}S			
$^{34}S^{2-}$			

Question 1(b)(i)

Isotope	^{32}S	^{33}S	^{34}S	^{36}S
Percentage abundance	95·02	0·75		0·02

Question 2(a)

Element	First electron affinity / kJ mol^{-1}
chlorine	−349
bromine	−325
iodine	−295

Question 2(c)

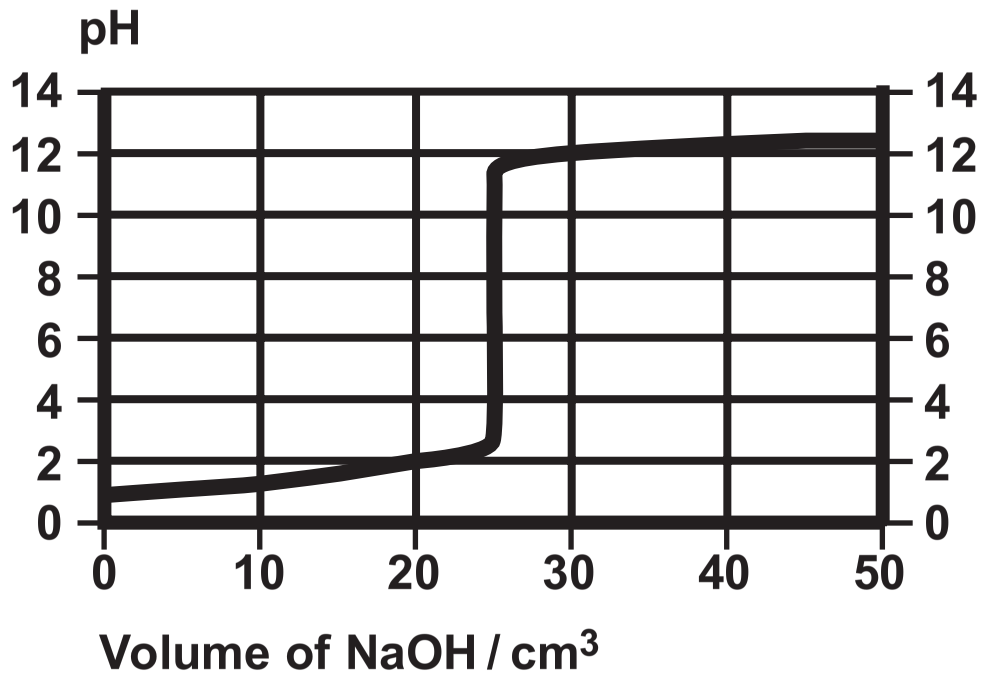
Element	Successive ionisation energies / kJ mol^{-1}				
A	578	1817	2745	11 578	14 831
B	653	1592	2987	4740	6686
C	738	1451	7733	10 541	13 629
D	1086	2353	4621	6223	37 832

Question 3(b)

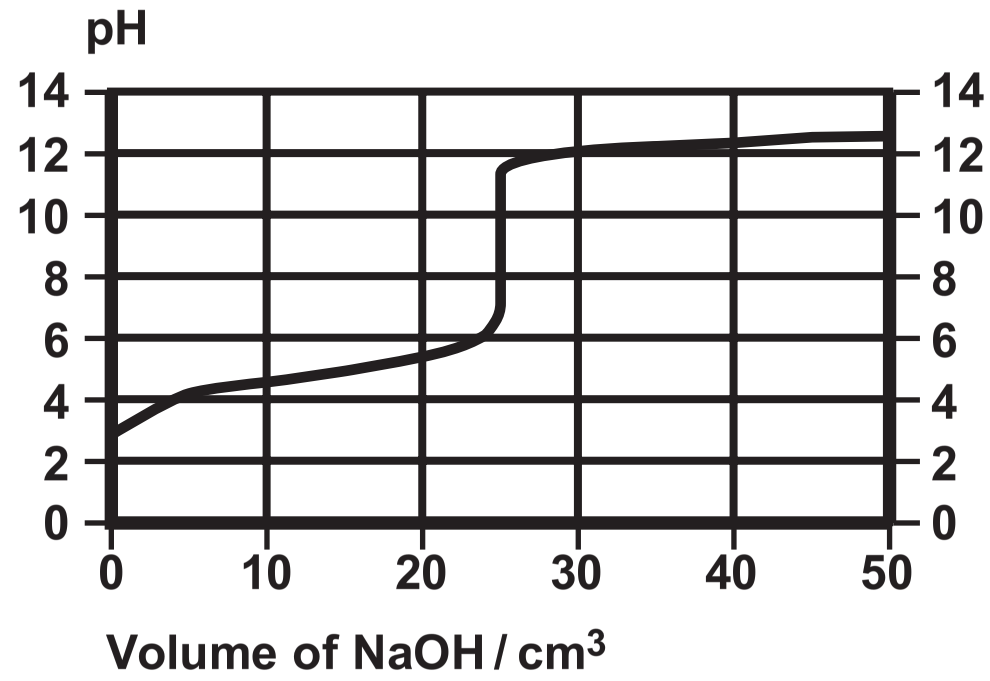
Solution	Formula of precipitate with silver nitrate	Colour of precipitate with silver nitrate	Observation with concentrated aqueous ammonia
calcium bromide(aq)			
calcium iodide(aq)			

Question 4(b)

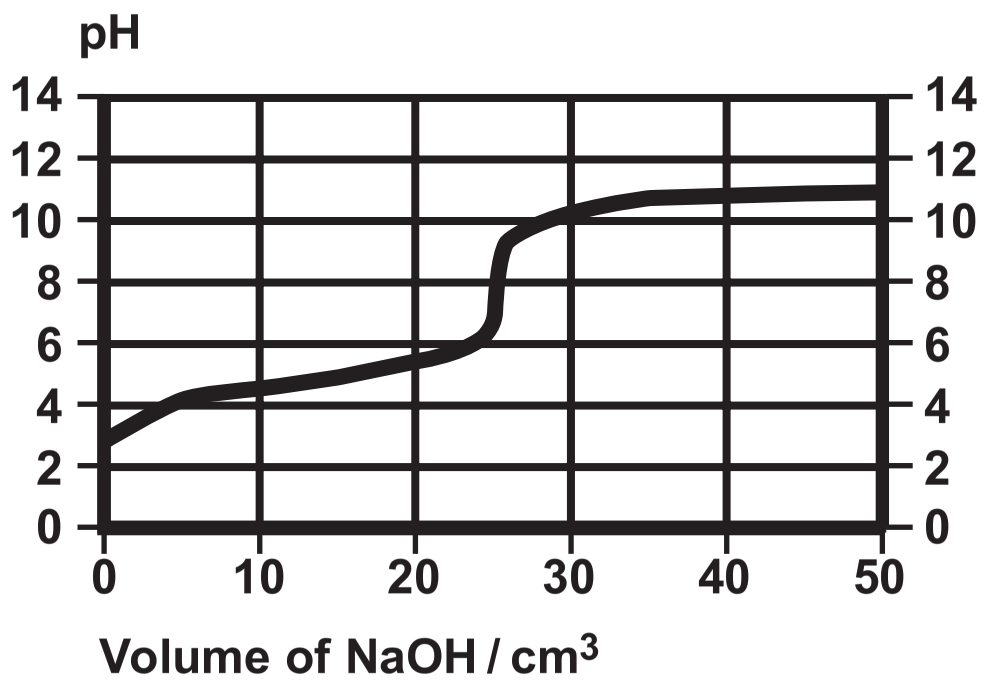
GRAPH A



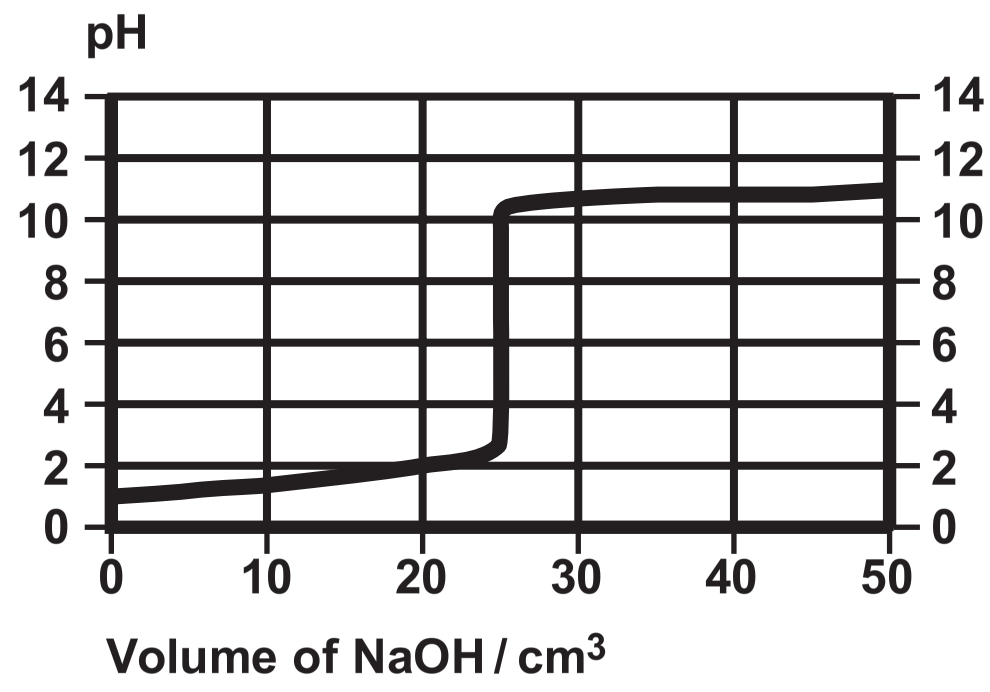
GRAPH B



GRAPH C



GRAPH D



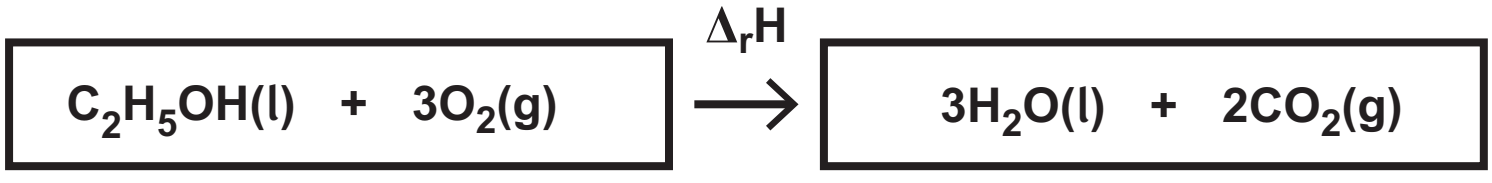
Question 4(c)

Name of acid	Formula of acid	pH of a solution of $0{\cdot}100\,mol\,dm^{-3}$ acid
hydrochloric acid	HCl	1·00
sulfuric acid	H_2SO_4	0·98
propanoic acid	CH_3CH_2COOH	2·94

Question 5(a)

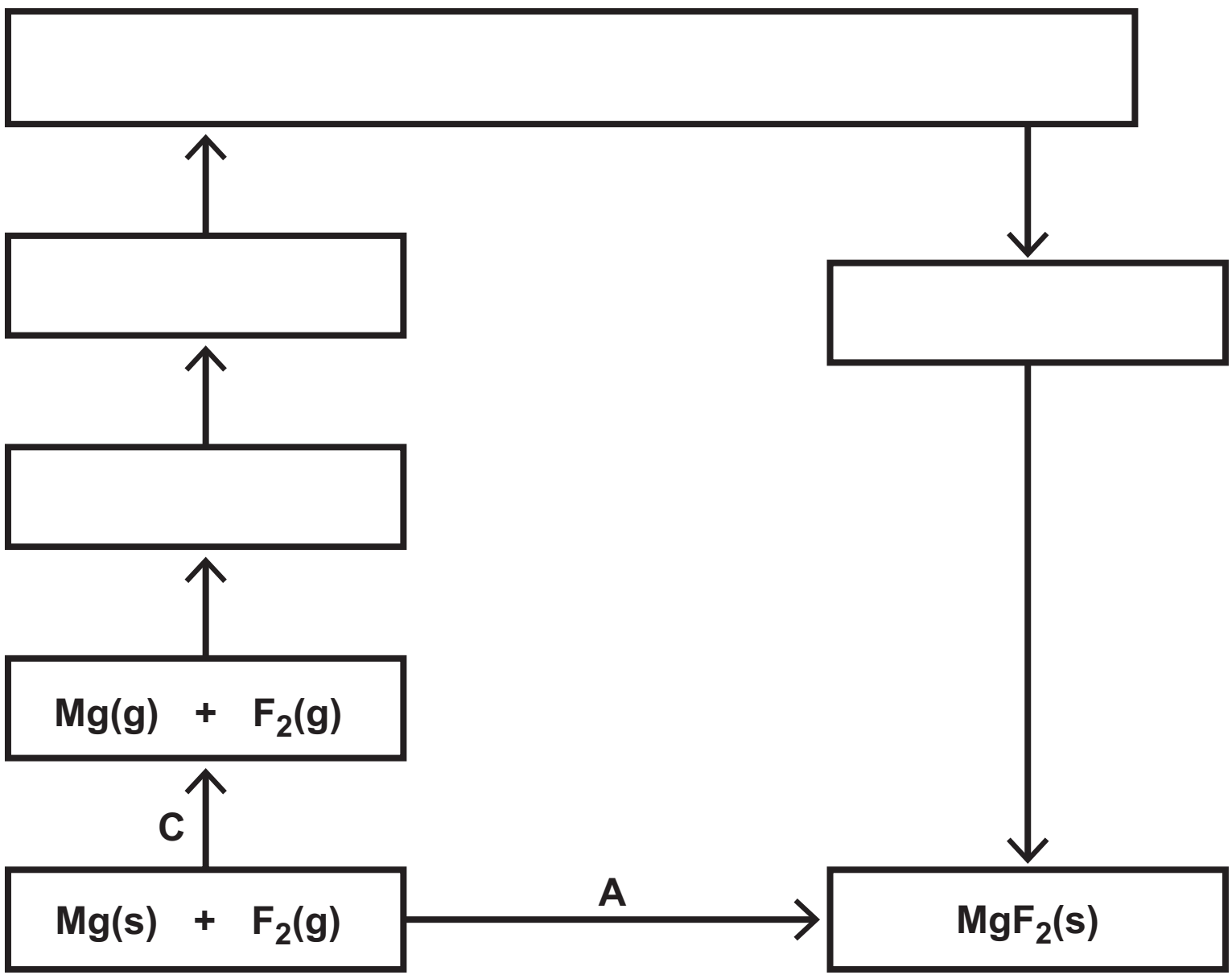
Bond	Mean bond enthalpy / kJ mol^{-1}
C—C	347
C—H	413
C—O	358
O—H	464
O═O	498
C═O	805

Question 5(b)(i)



Question 8(c)(i)

The cycle is not drawn to scale.



Question 8(c)(iii)

Compound	Experimental lattice energy / kJ mol^{-1}	Theoretical lattice energy / kJ mol^{-1}
MgF_2	−2957	−2913
MgI_2	−2327	−1944

Question 9(a)

Compound	$NaHCO_3(s)$	$Na_2CO_3(s)$	$CO_2(g)$	$H_2O(l)$
Standard molar entropy / $J\,K^{-1}\,mol^{-1}$	101·7	135·0	213·6	69·9

Question 1(a)

Species	Number of protons	Number of neutrons	Number of electrons
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^{33}S			
$^{34}S^{2-}$			

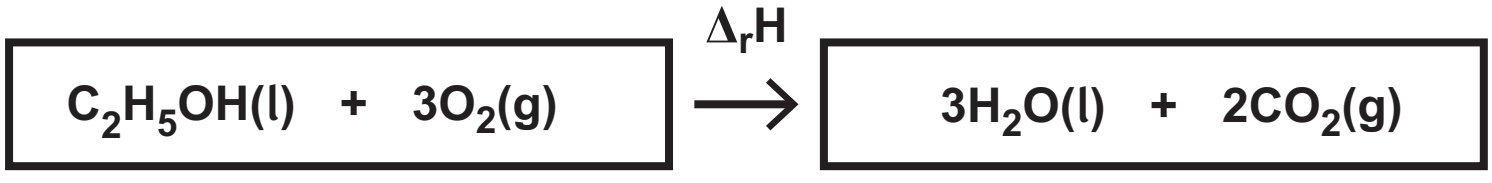
Question 1(b)(i)

Isotope	^{32}S	^{33}S	^{34}S	^{36}S
Percentage abundance	95·02	0·75		0·02

Question 3(b)

Solution	Formula of precipitate with silver nitrate	Colour of precipitate with silver nitrate	Observation with concentrated aqueous ammonia
calcium bromide(aq)			
calcium iodide(aq)			

Question 5(b)(i)



Question 8(c)(i)

The cycle is not drawn to scale.

