

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

# **Chemistry**

**Advanced**

**PAPER 1: Advanced Inorganic and Physical Chemistry**

**Monday 12 June 2023 – Morning**

## **Diagram Booklet**

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

<b>Surname</b>					
<b>Other names</b>					
<b>Centre Number</b>					
<b>Candidate Number</b>					

## INSTRUCTIONS

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

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

## Contents

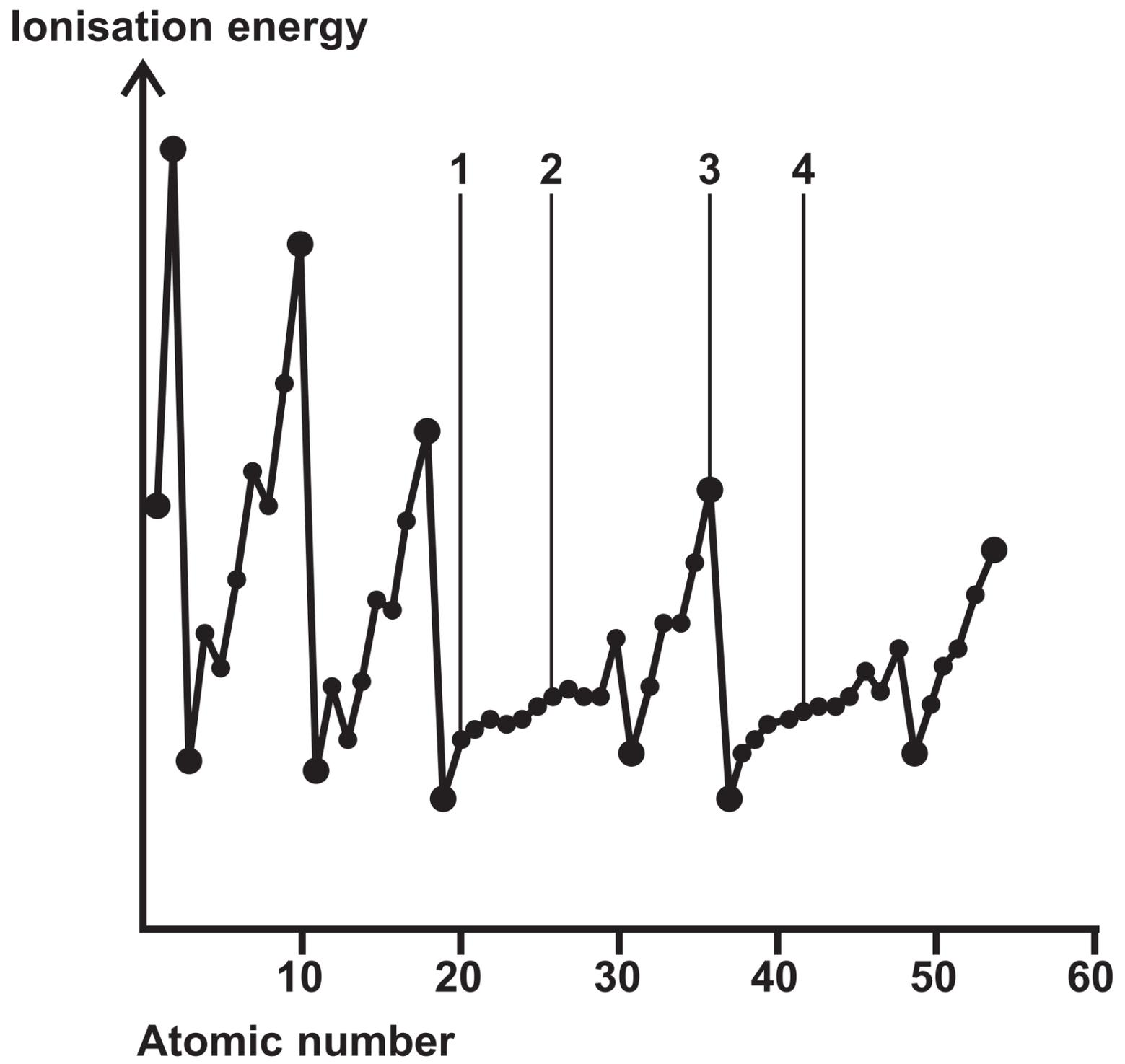
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### Spare Copies

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## Question 1(a)



**Question 2(b)**

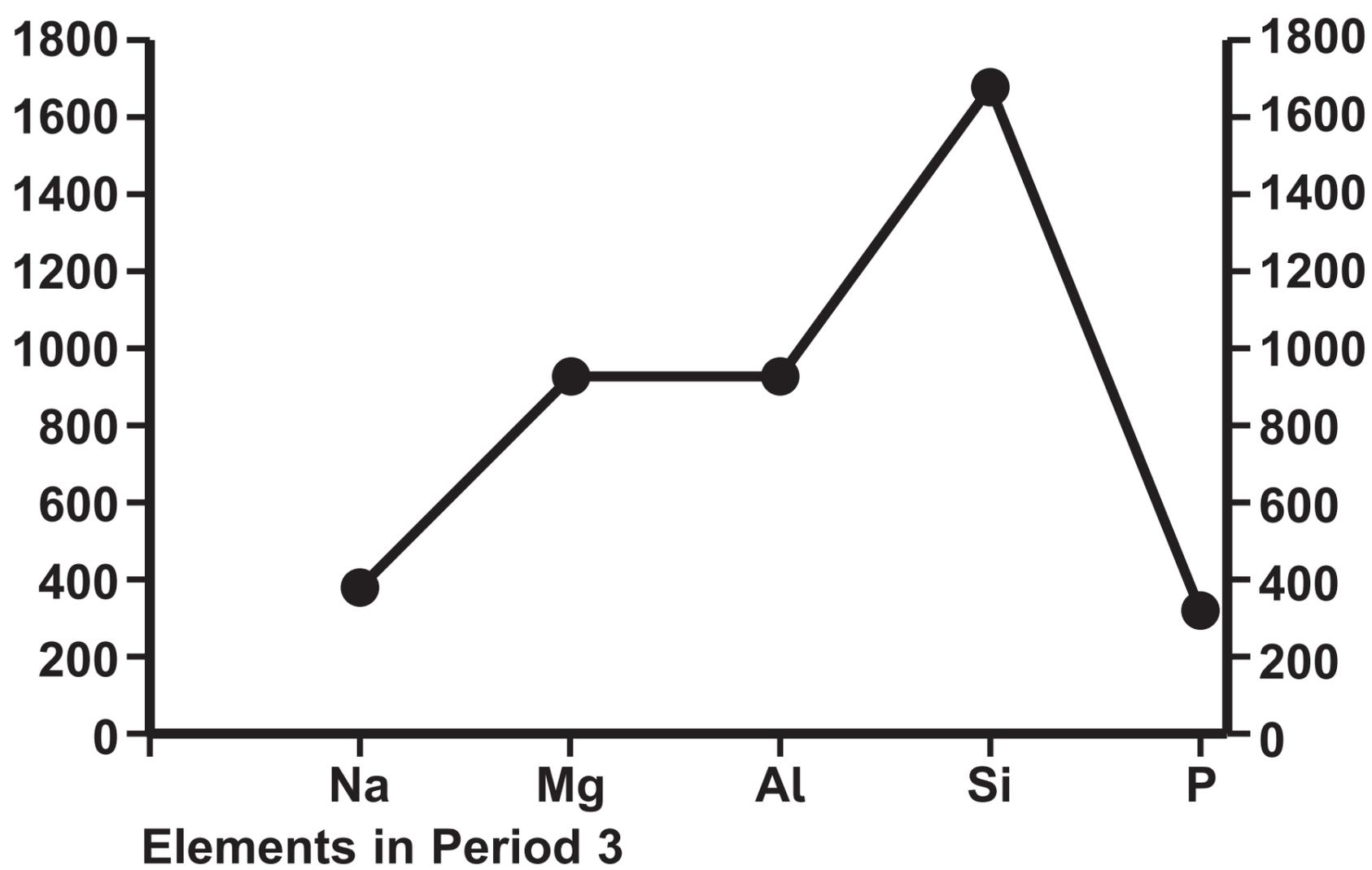
<b>s orbital</b>	<b>p orbital</b>

## Question 3(c)

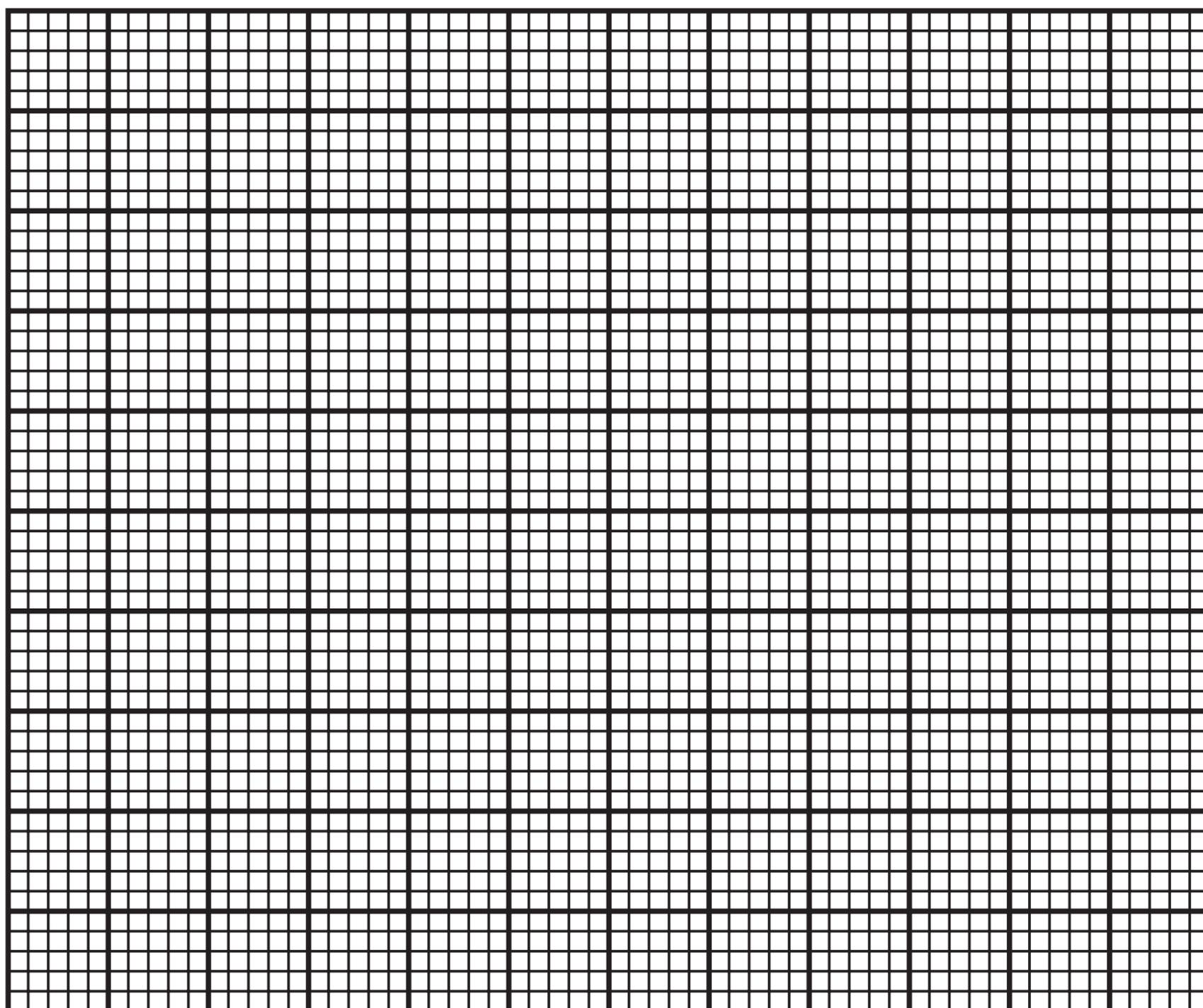


## Question 4

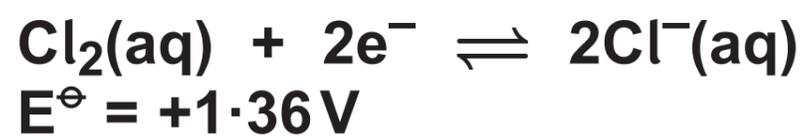
## Melting temperature / K



## Question 5(a)(i)

 $\Delta G / \text{kJ mol}^{-1}$ 

Temperature / K

**Question 7(d)****Equilibrium 1****Equilibrium 2**

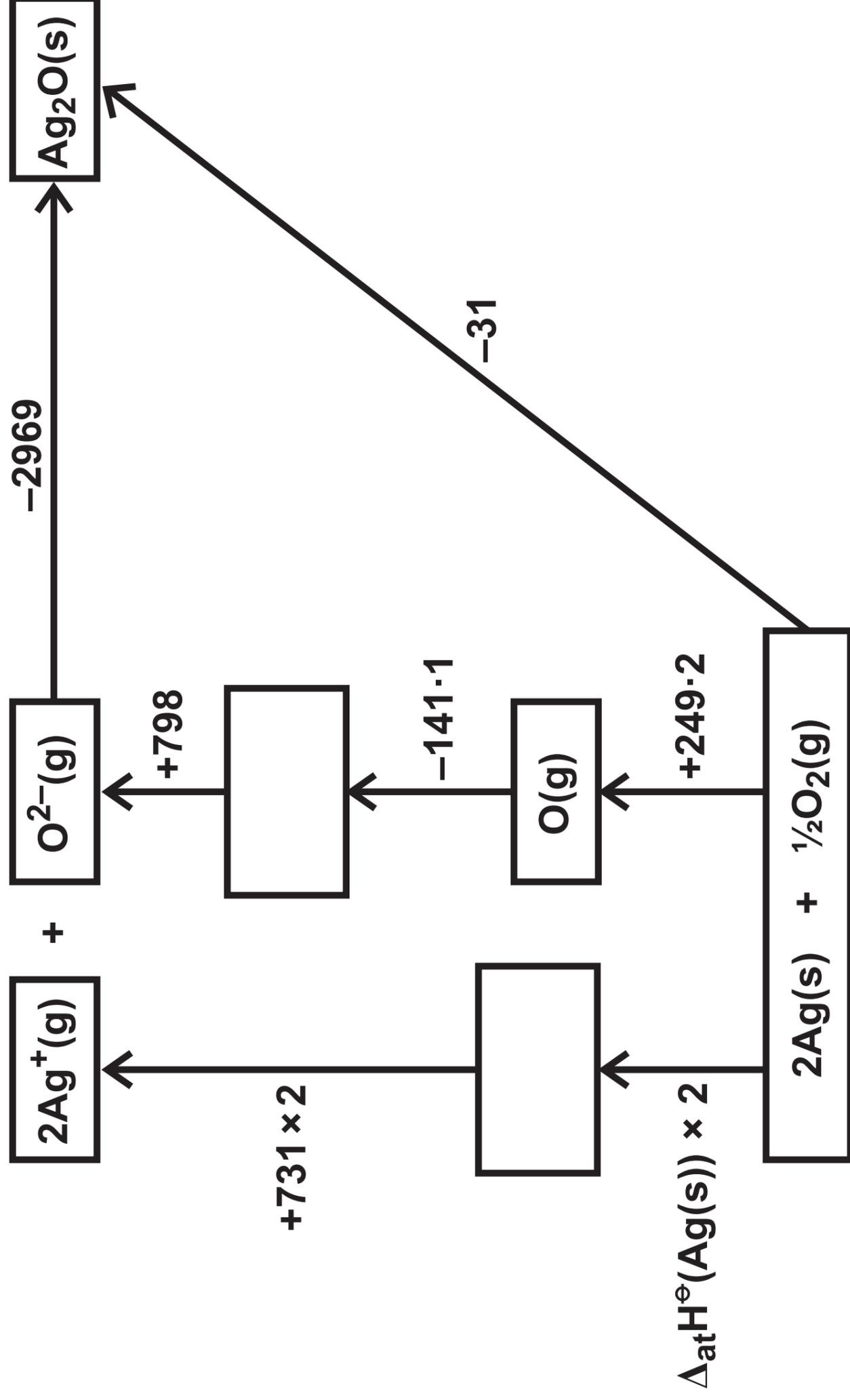
**Question 7(b)(ii)**

<b>Element</b>	<b>Atomic number</b>	<b>1st ionisation energy / kJ mol<sup>-1</sup></b>	<b>2nd ionisation energy / kJ mol<sup>-1</sup></b>	<b>Metallic radius / nm</b>
<b>Chromium</b>	<b>24</b>	<b>653</b>	<b>1592</b>	<b>0.129</b>
<b>Calcium</b>	<b>20</b>	<b>590</b>	<b>1145</b>	<b>0.197</b>

## Question 9(b)

<b>Compound</b>	<b>Experimental lattice energy / kJ mol<sup>-1</sup></b>	<b>Theoretical lattice energy / kJ mol<sup>-1</sup></b>
<b>Silver chloride</b>	<b>-905</b>	<b>-833</b>

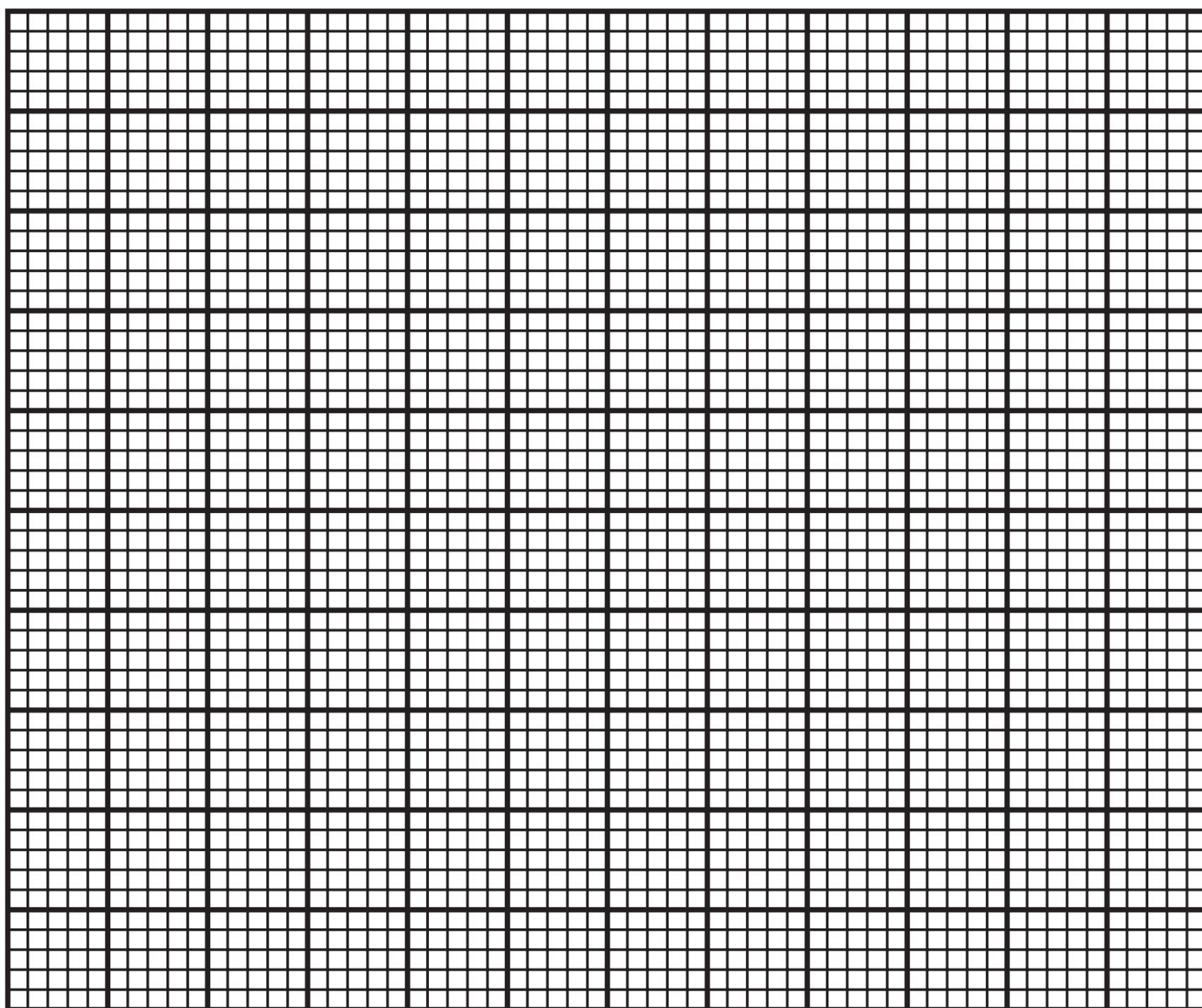
Question 9(a)



**Question 2(b)**

<b>s orbital</b>	<b>p orbital</b>

## Question 5(a)(i)

 $\Delta G / \text{kJ mol}^{-1}$ 

Temperature / K

Question 10(d)

Half-cell	Electrode system	$E^\ominus / V$
A	$\text{MnO}_2(\text{s}) + 4\text{H}^+(\text{aq}) + \text{e}^- \rightleftharpoons \text{Mn}^{3+}(\text{aq}) + 2\text{H}_2\text{O}(\text{l})$	+0.95
B	$\text{Mn}^{3+}(\text{aq}) + \text{e}^- \rightleftharpoons \text{Mn}^{2+}(\text{aq})$	+1.51

Question 9(a)

