

Paper Reference(s) 9CH0/03  
Pearson Edexcel Level 3 GCE

Chemistry  
Advanced  
PAPER 3: General and Practical Principles in Chemistry

Friday 23 June 2023 – Morning

Diagram Booklet

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

Surname					
Other names					
Centre Number					
Candidate Number					

## 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**

### **Page**

<b>4</b>	<b>Question 1(a)</b>
<b>5–6</b>	<b>Question 3(d)</b>
<b>7</b>	<b>Question 5(a)</b>
<b>8</b>	<b>Question 5(b)</b>
<b>9</b>	<b>Question 5(d)</b>
<b>10</b>	<b>Question 6(b)</b>
<b>11</b>	<b>Question 6(b)(ii)</b>
<b>12</b>	<b>Question 6(b)(ii) – grid</b>
<b>13</b>	<b>Question 7(c)(i)</b>
<b>14</b>	<b>Question 8(b)</b>
<b>15</b>	<b>Question 8(c)</b>
<b>16</b>	<b>Question 9(c)</b>
<b>17</b>	<b>Question 10(b)(i)</b>

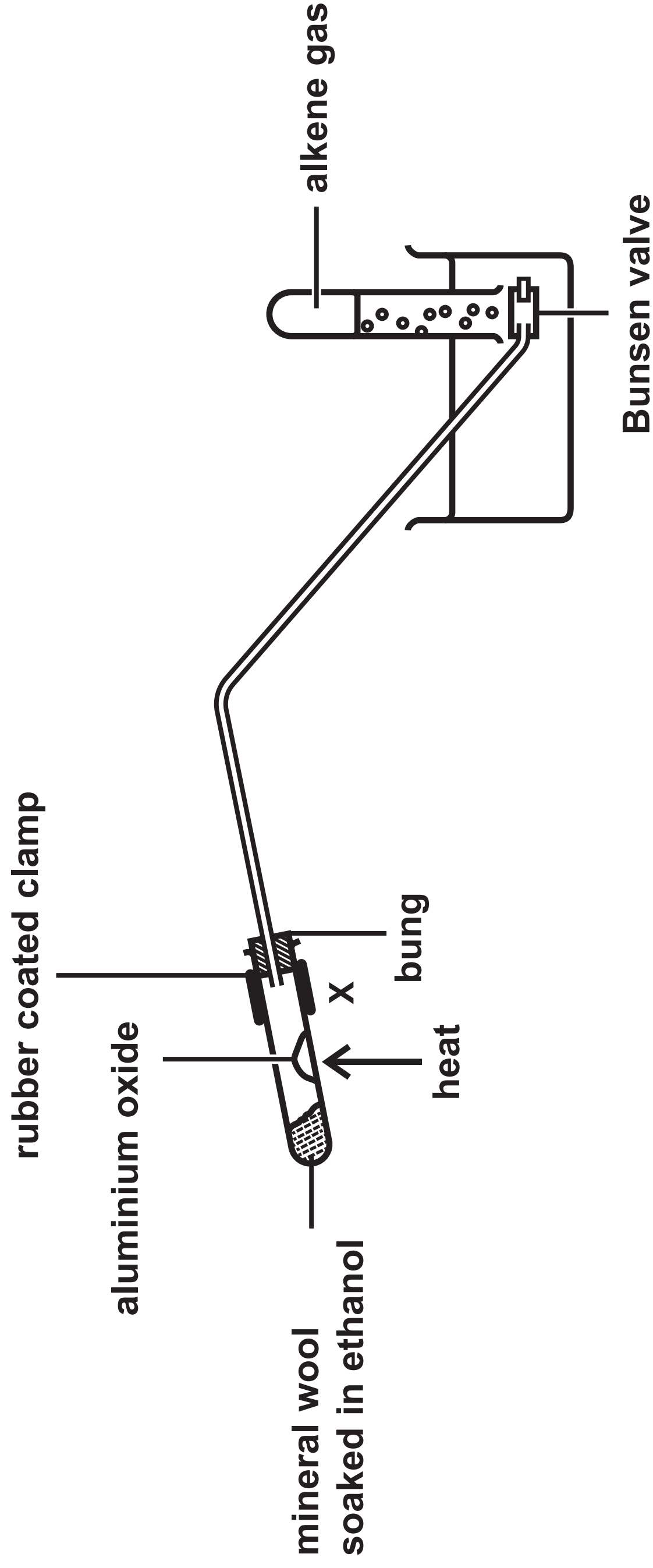
### **Spare Copies**

<b>18</b>	<b>Question 1(a)</b>
<b>19</b>	<b>Question 6(b)(ii) – grid</b>
<b>20</b>	<b>Question 7(c)(i)</b>
<b>21</b>	<b>Question 8(b)</b>
<b>22</b>	<b>Question 9(c)</b>

## Question 1(a)



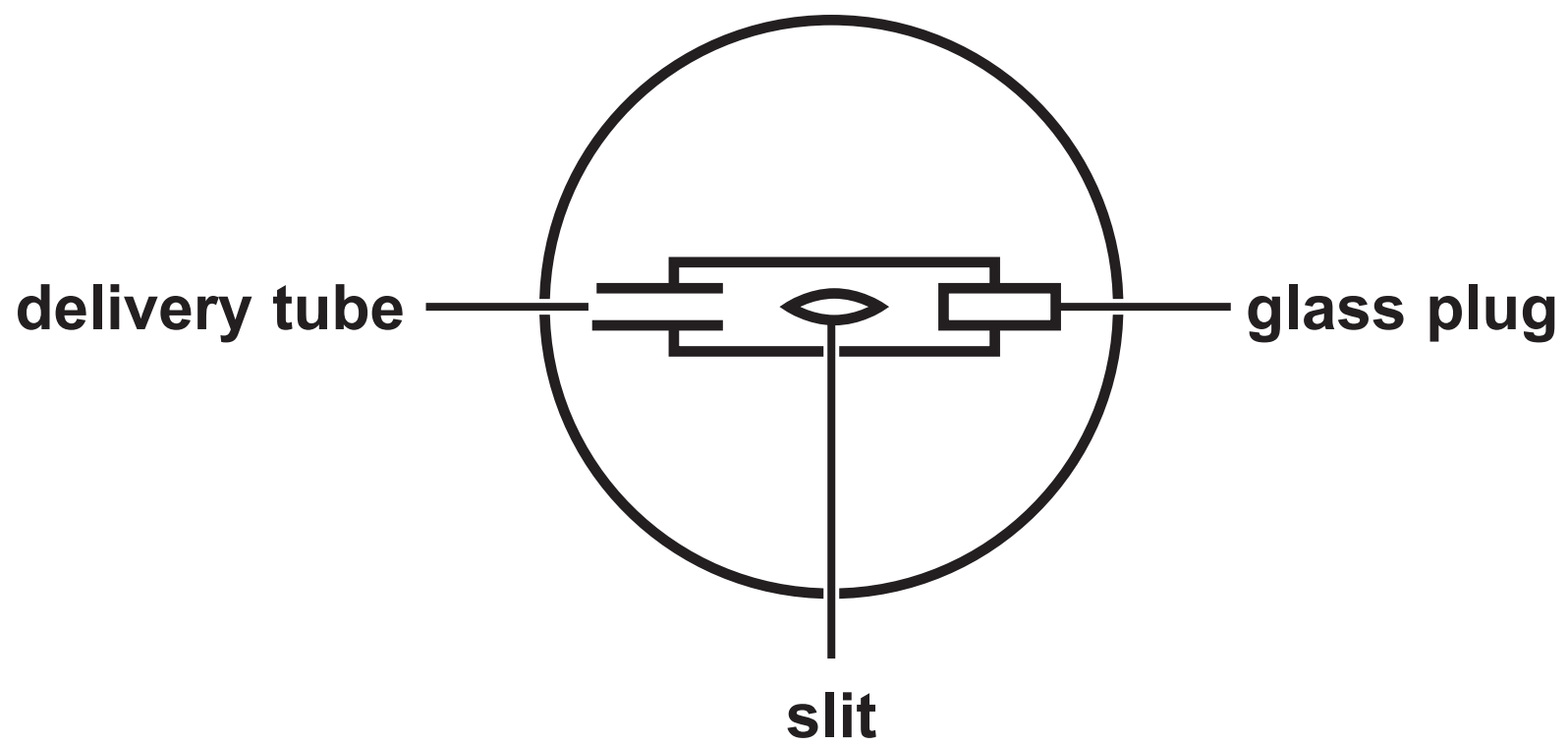
Question 3(d)



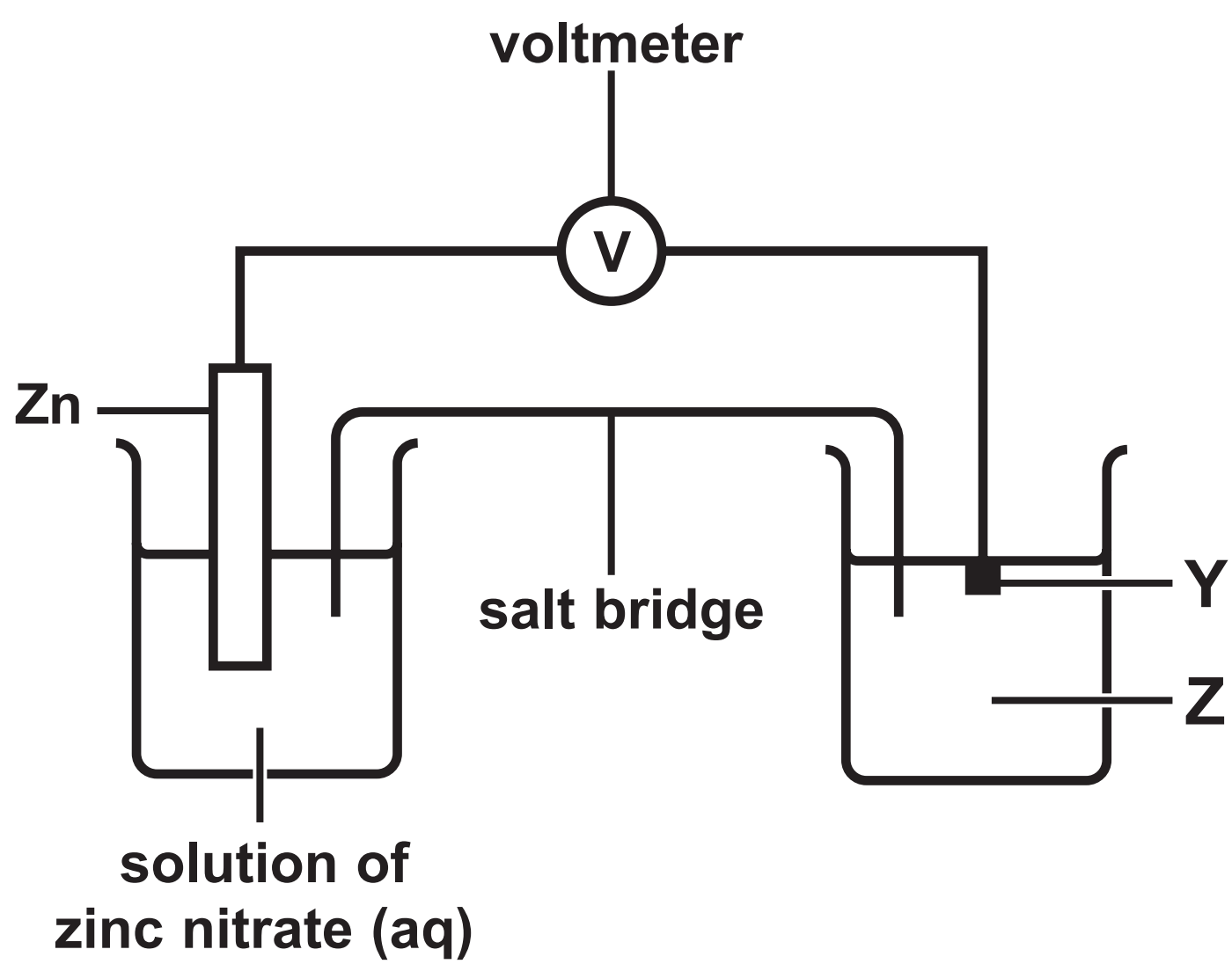
(continued on the next page)

3(d) continued.

Bunsen valve – expanded top view



## Question 5(a)

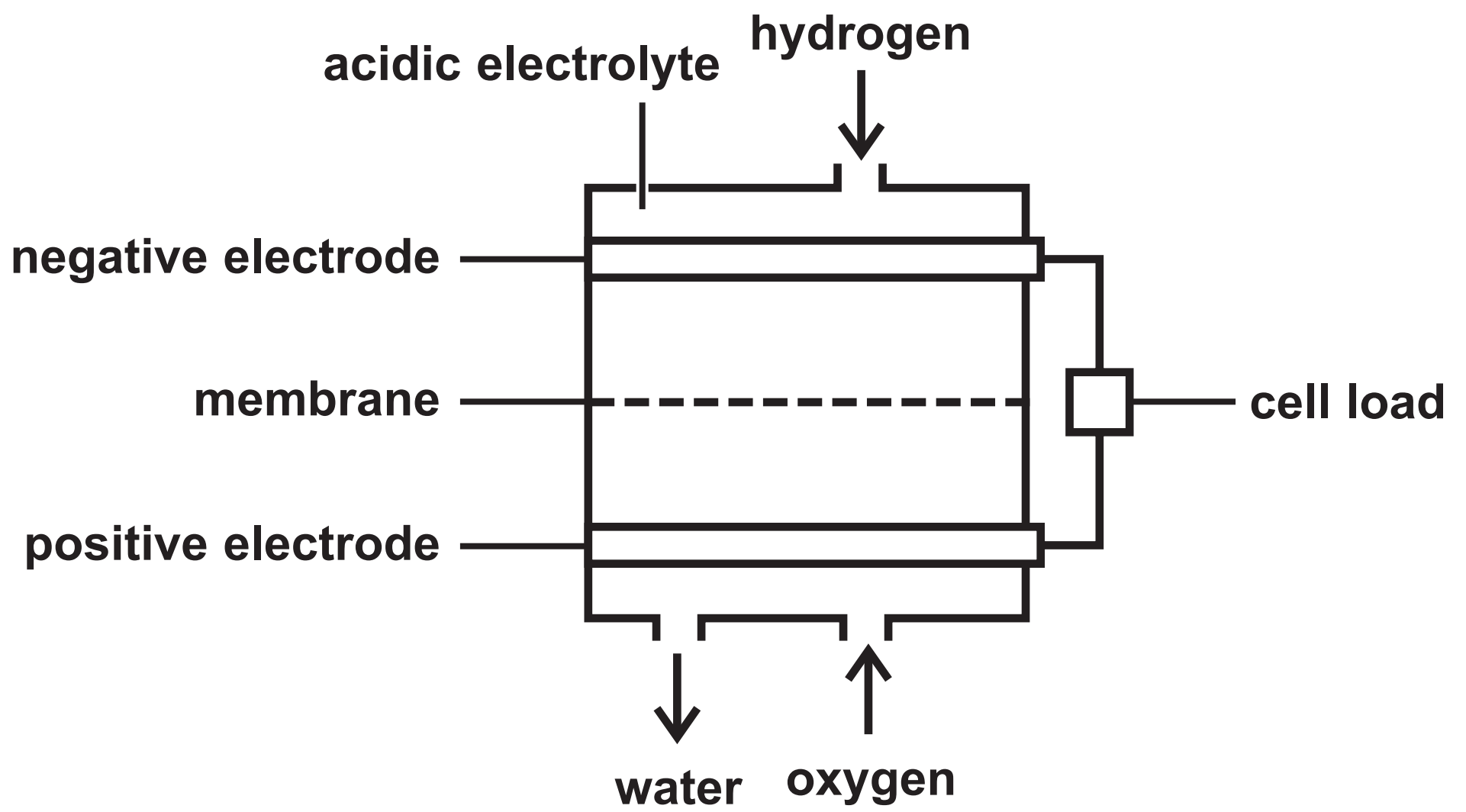


Question 5(b)

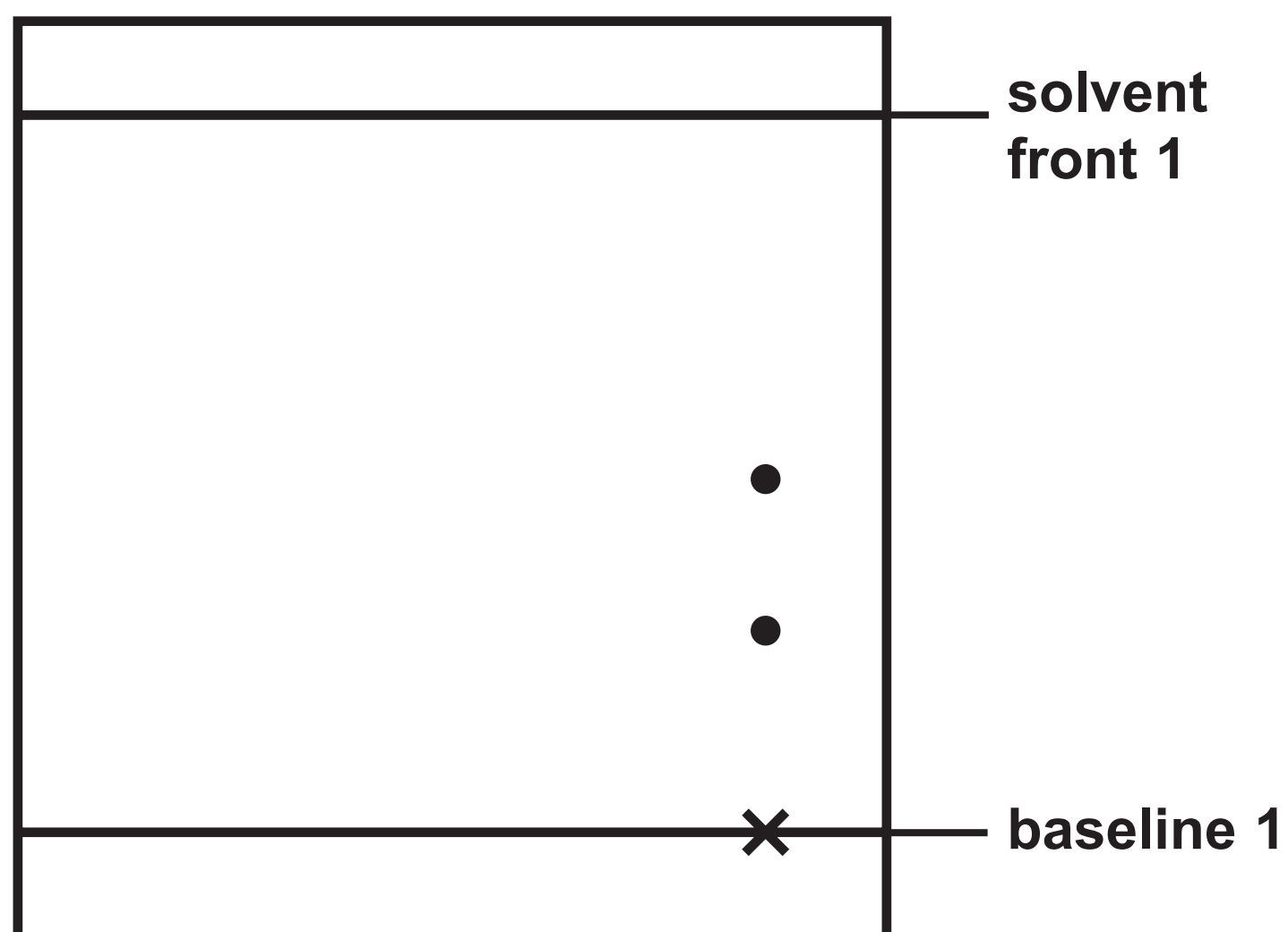
Electrode system	$E^\ominus / \text{V}$
$\text{Cr}^{2+}(\text{aq}) + 2\text{e}^- \rightleftharpoons \text{Cr}(\text{s})$	$-0.91$
$\text{Cr}^{3+}(\text{aq}) + \text{e}^- \rightleftharpoons \text{Cr}^{2+}(\text{aq})$	$-0.41$
$\frac{1}{2}\text{Cr}_2\text{O}_7^{2-}(\text{aq}) + 7\text{H}^+(\text{aq}) + 3\text{e}^- \rightleftharpoons \text{Cr}^{3+}(\text{aq}) + 3\frac{1}{2}\text{H}_2\text{O}(\text{l})$	$+1.33$
$\text{Zn}^{2+}(\text{aq}) + 2\text{e}^- \rightleftharpoons \text{Zn}(\text{s})$	$-0.76$



## Question 5(d)



## Question 6(b)

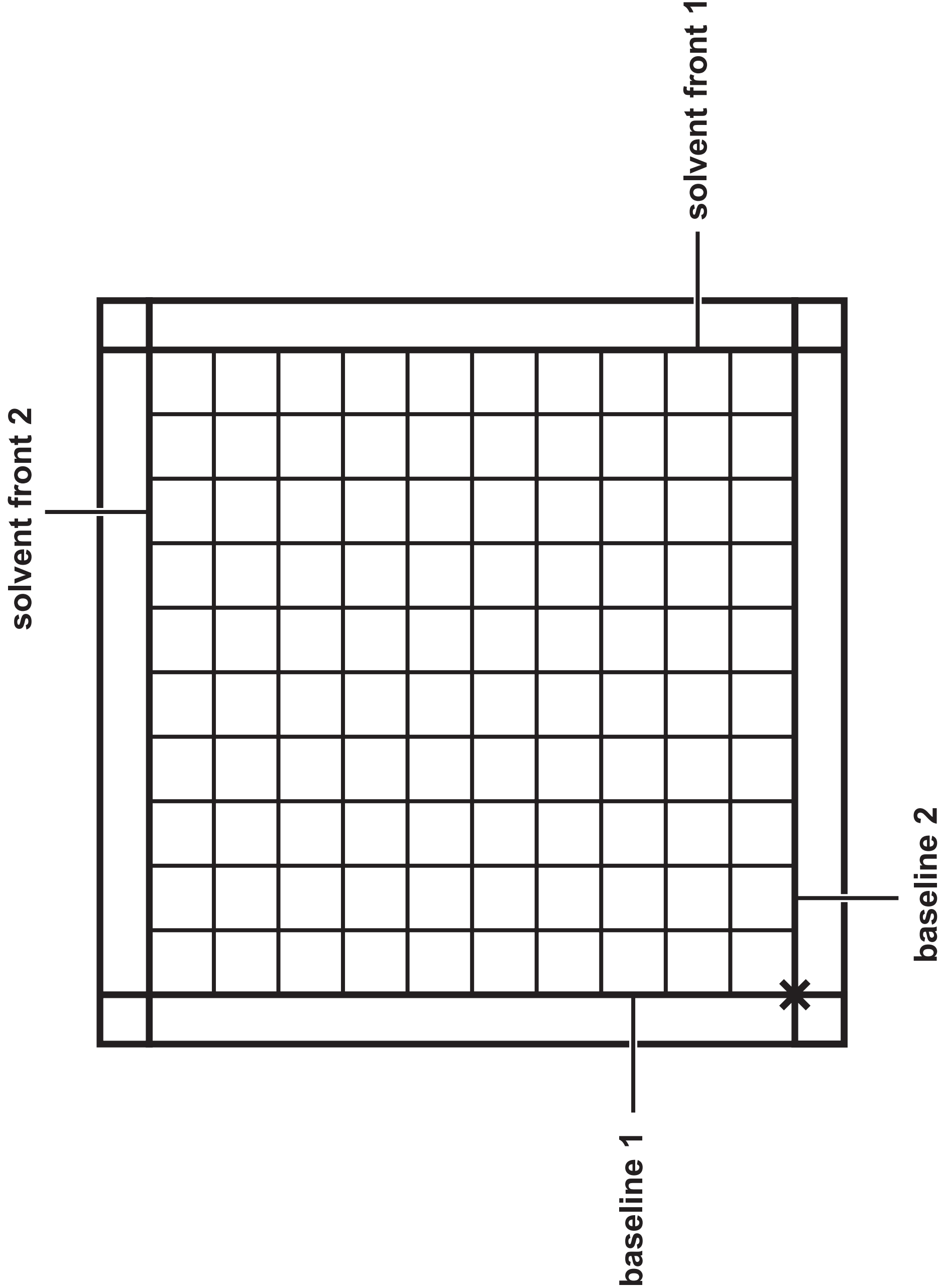


**Question 6(b)(ii)**

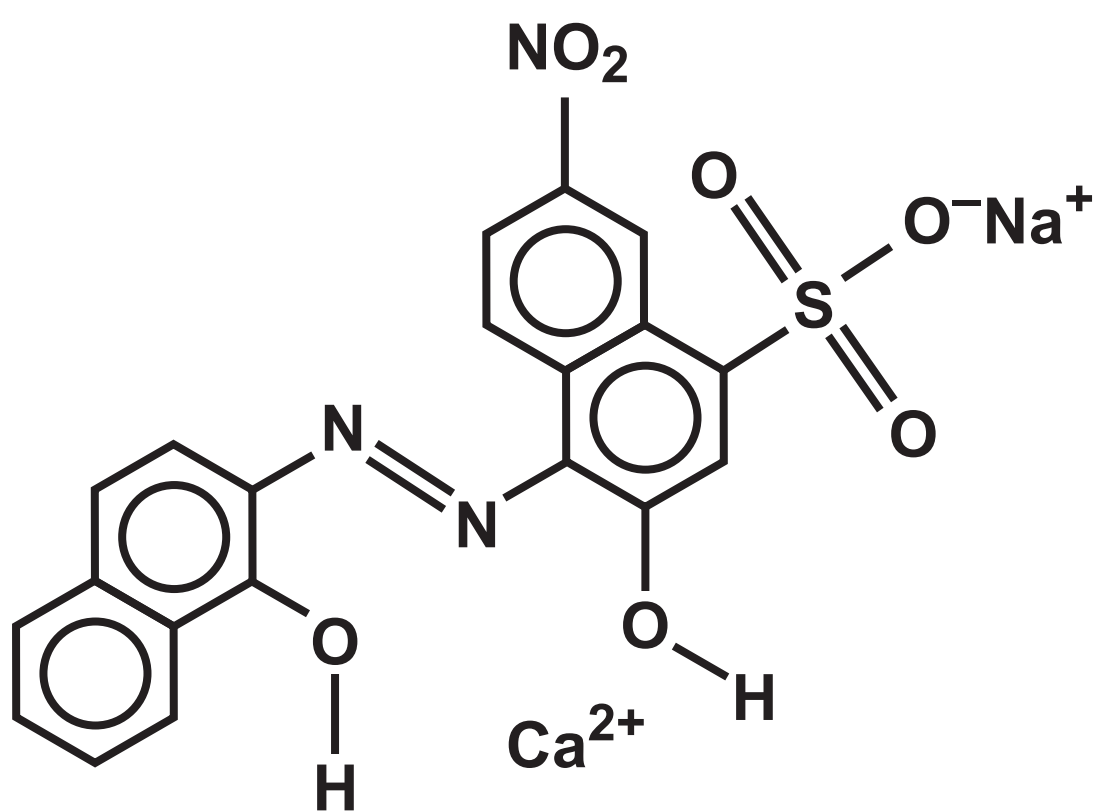
<b>Amino acid</b>	<b>R<sub>f</sub> in solvent 1</b>	<b>R<sub>f</sub> in solvent 2</b>
<b>alanine</b>	<b>0·38</b>	<b>0·43</b>
<b>glycine</b>	<b>0·33</b>	<b>0·26</b>
<b>valine</b>	<b>0·39</b>	<b>0·58</b>

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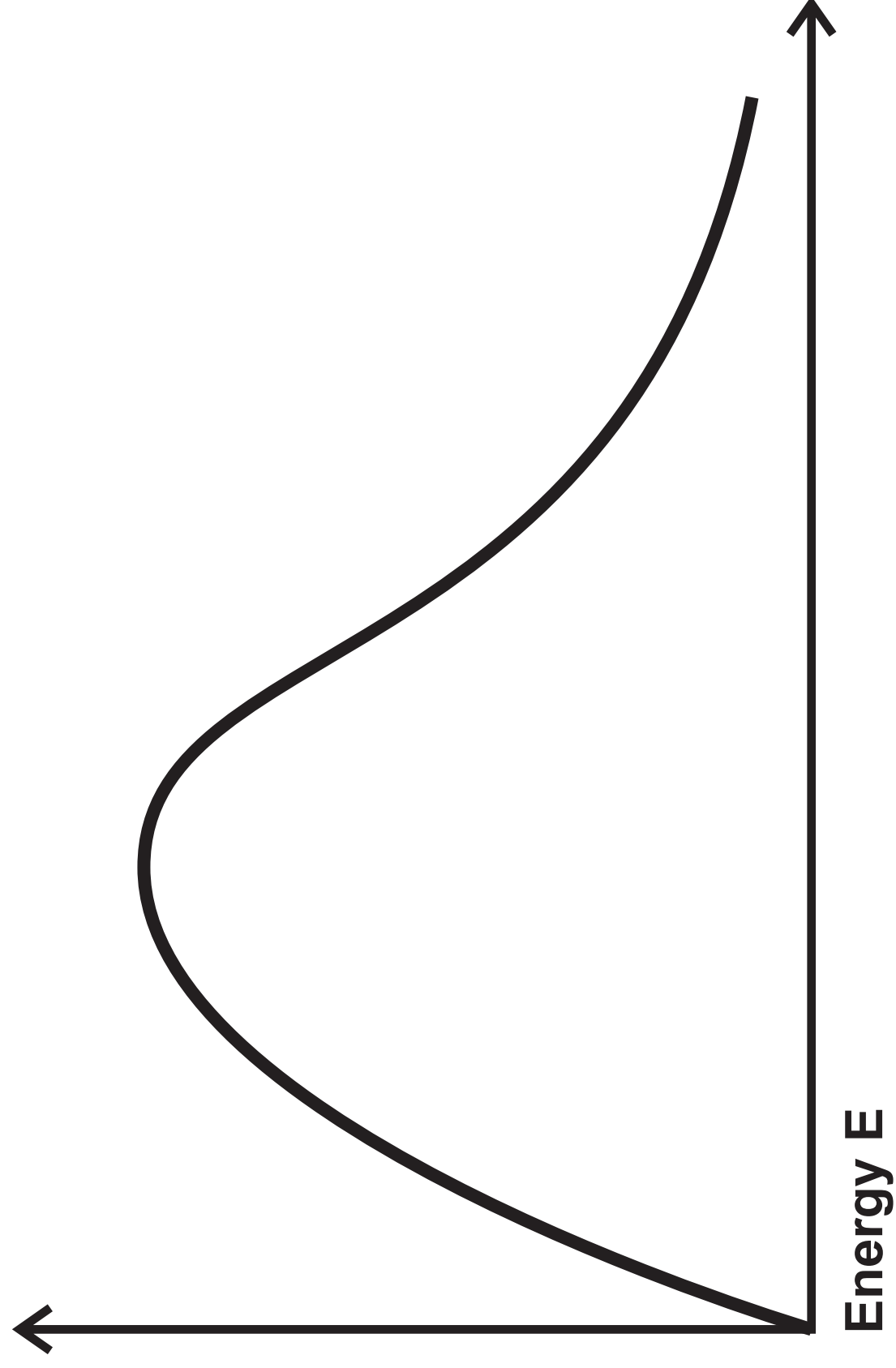
6(b)(ii) continued.



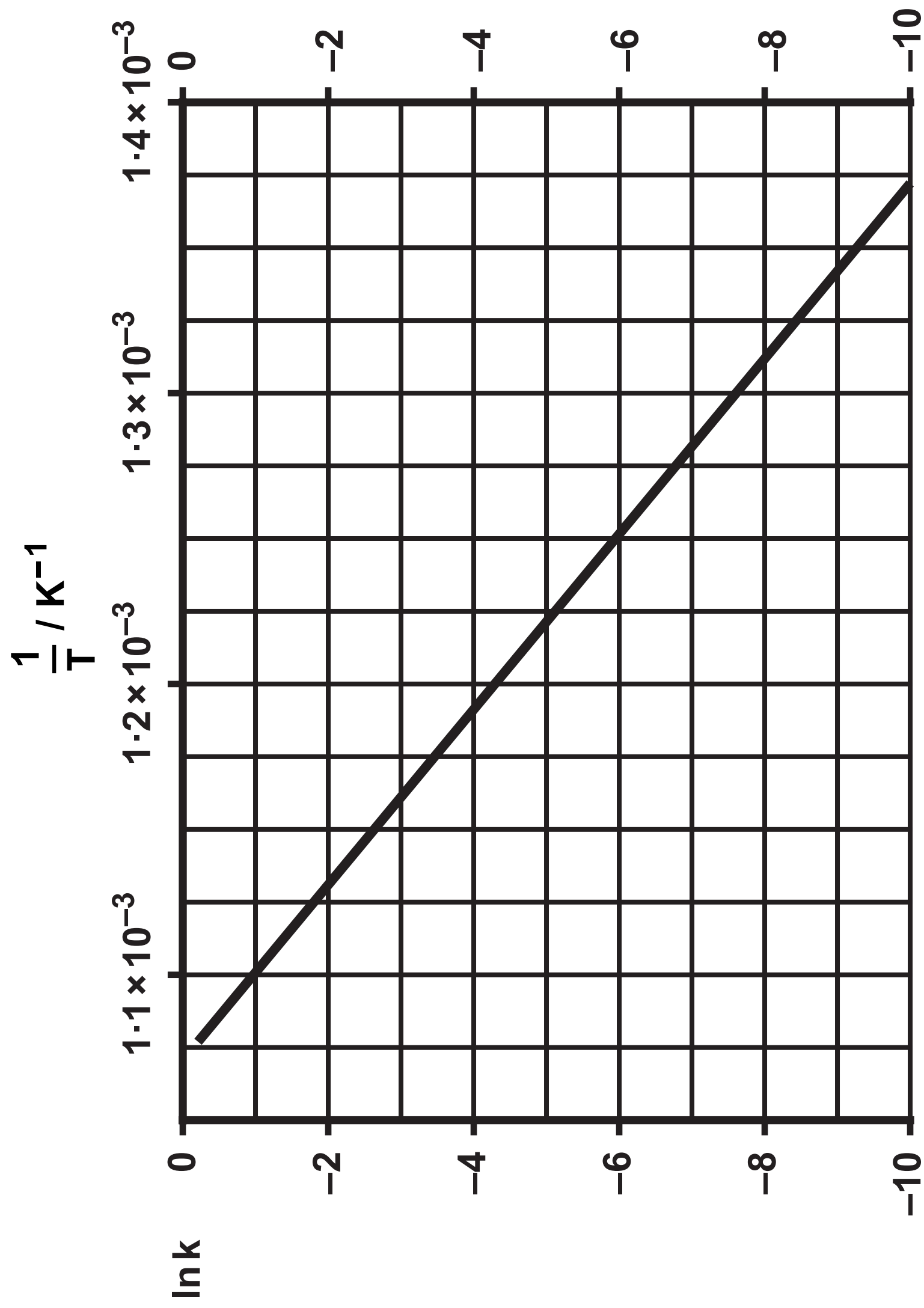
## Question 7(c)(i)



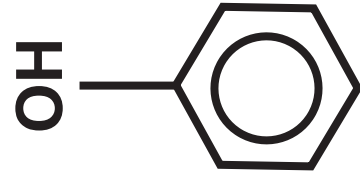
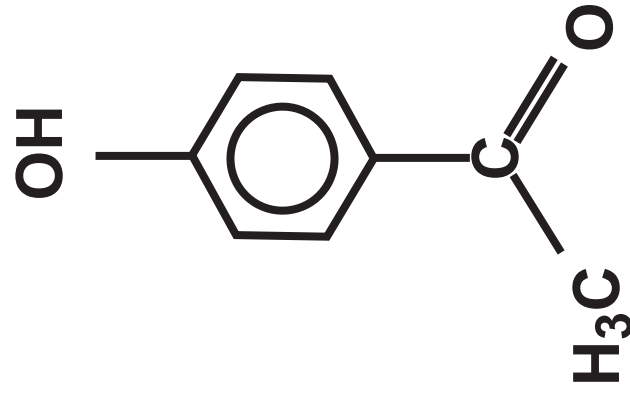
Number of molecules with energy  $E$



# Question 8(c)



Question 9(c)



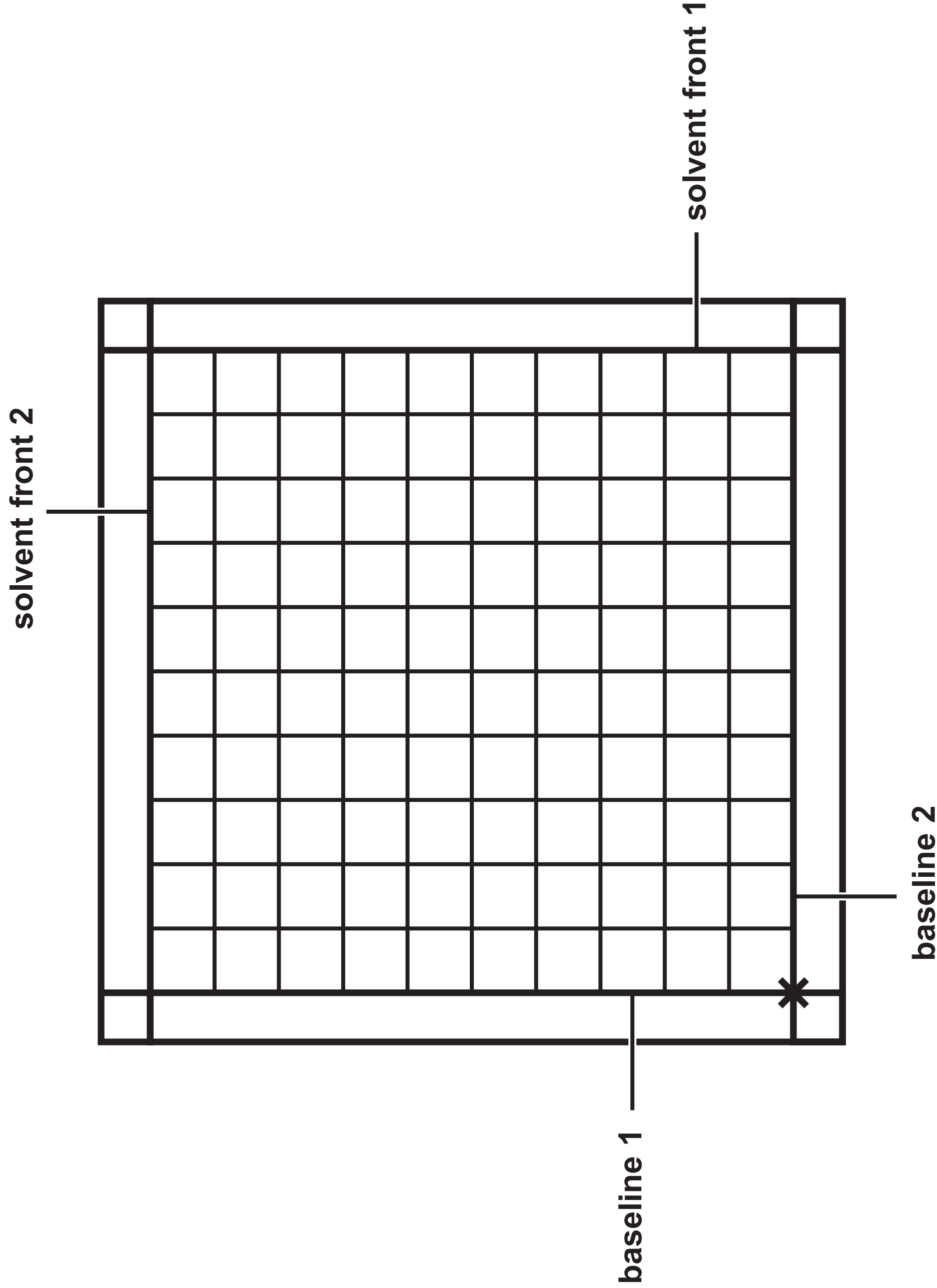


## Question 10(b)(i)

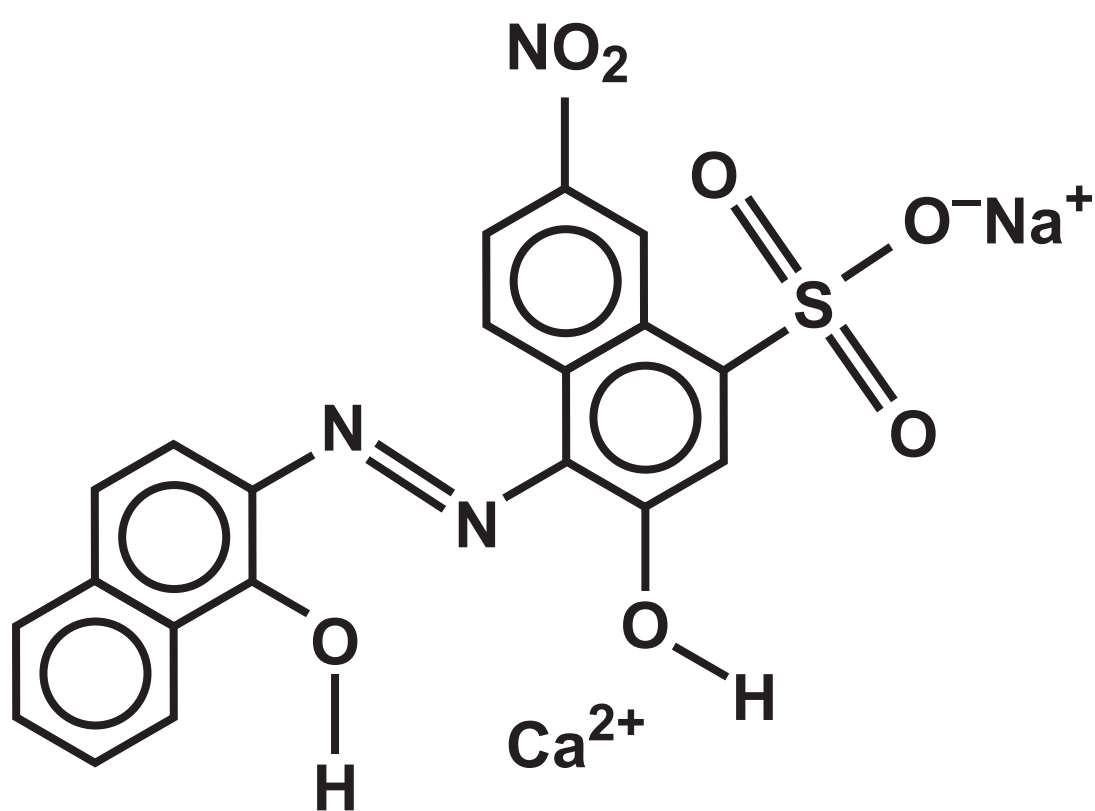
Substance	$S^\ominus / \text{J mol}^{-1} \text{K}^{-1}$
Ni(s)	+29.9
CO(g)	+197.6
Ni(CO) <sub>4</sub> (g)	+313.4

## Question 1(a)

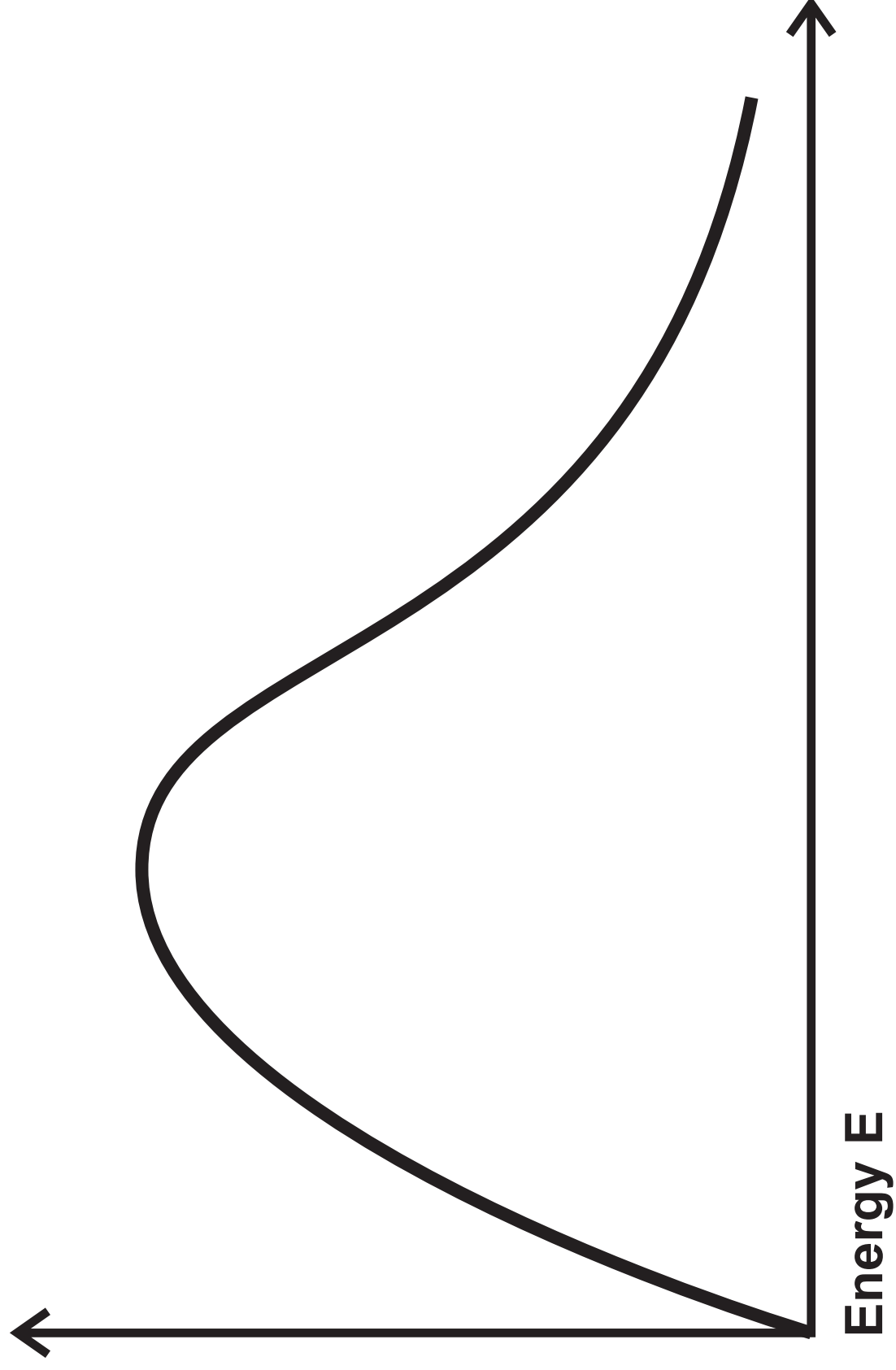




## Question 7(c)(i)



Number of molecules with energy  $E$



## Question 9(c)

