

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.

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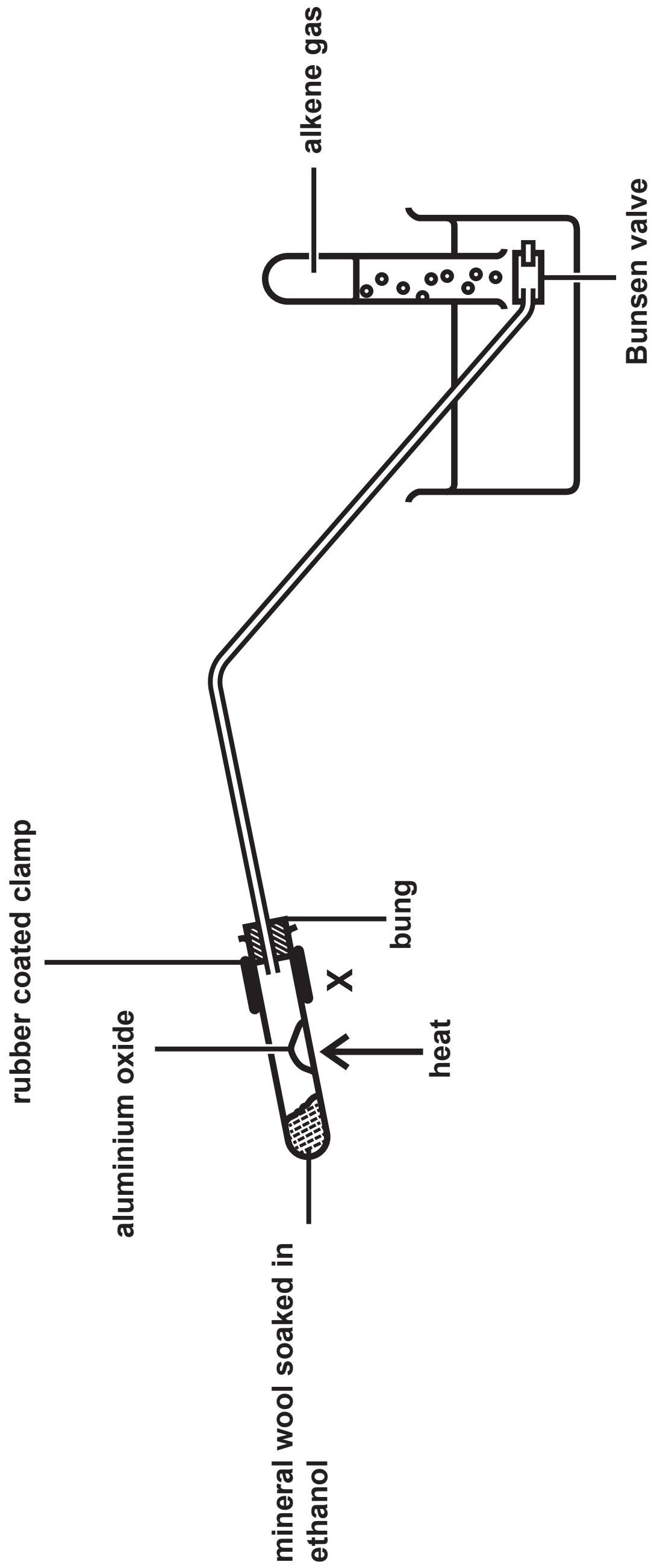
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Question 1(a)

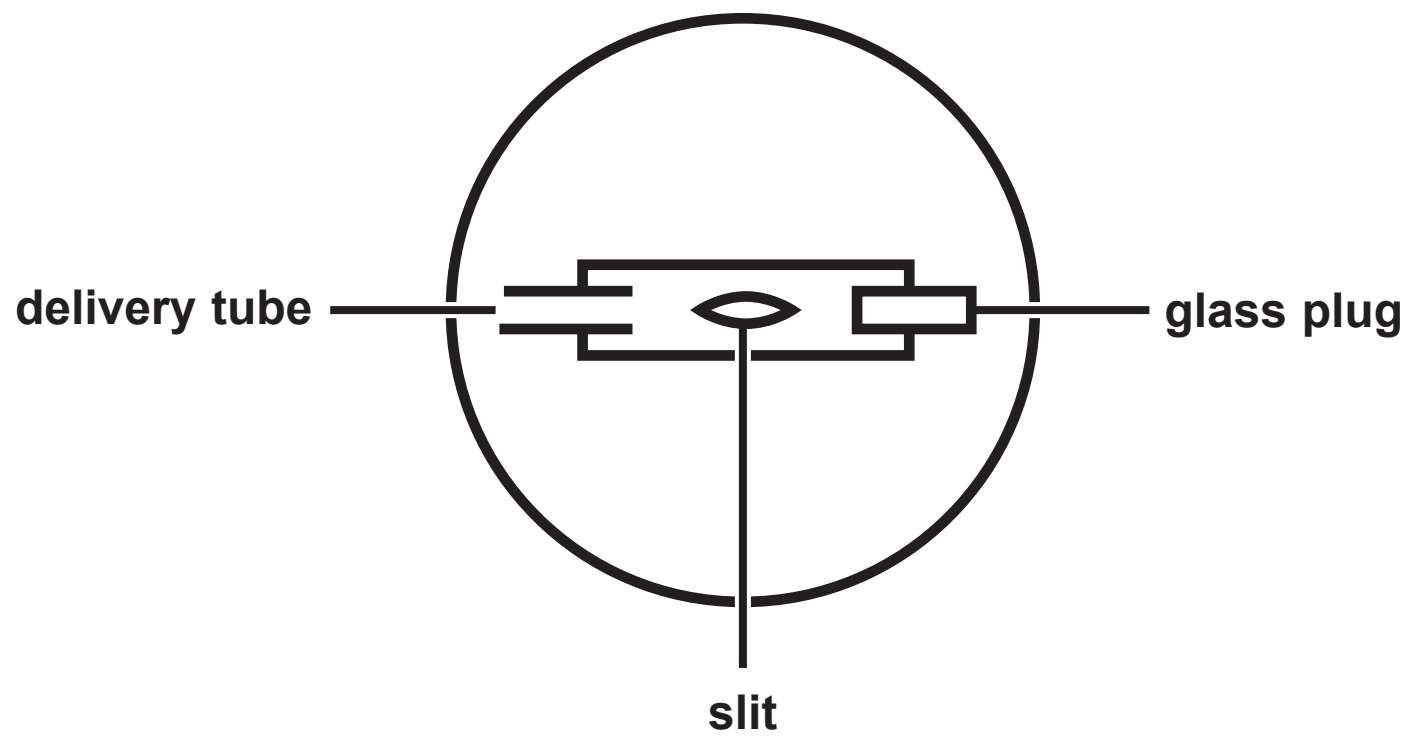




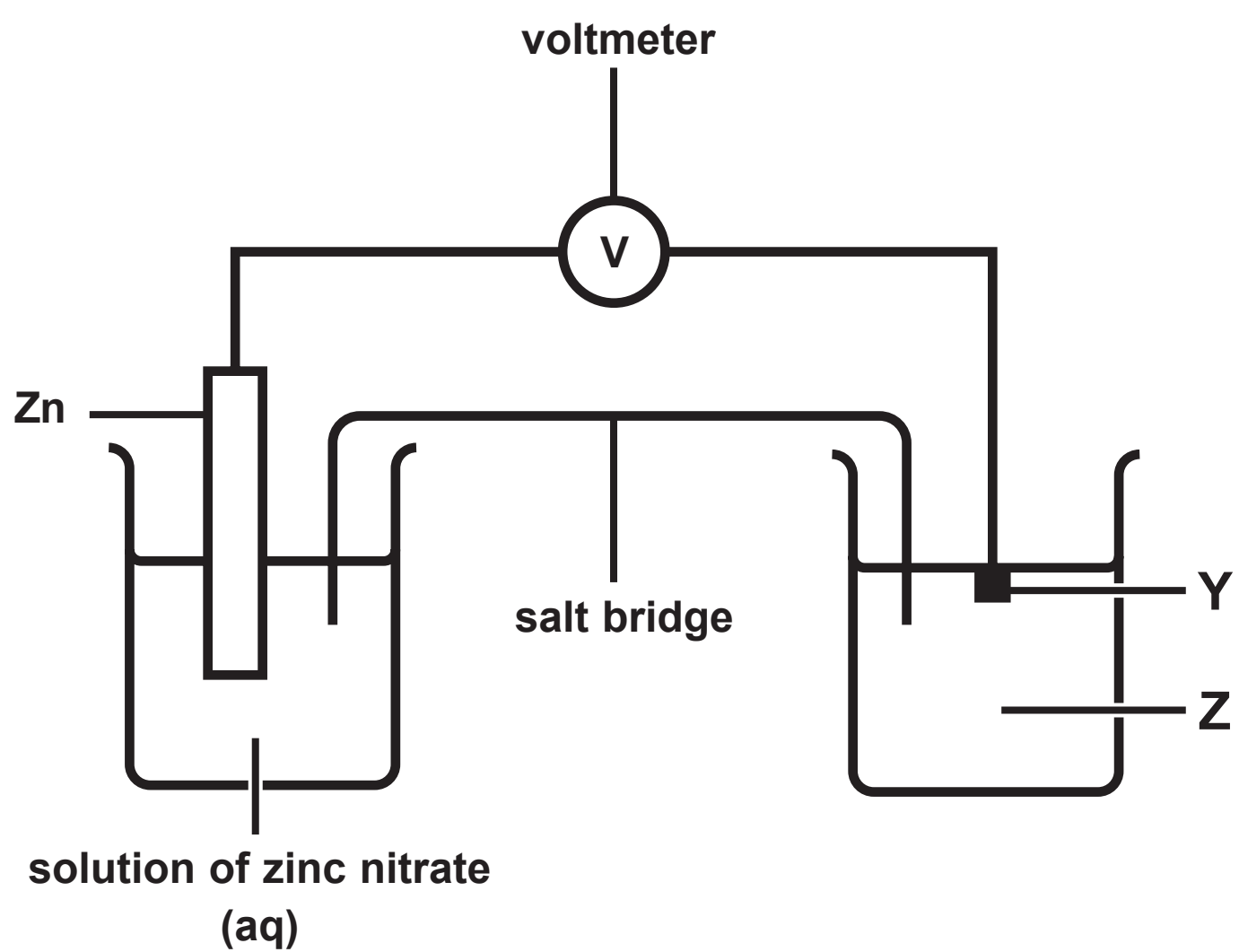
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3(d) continued.

Bunsen valve – expanded top view



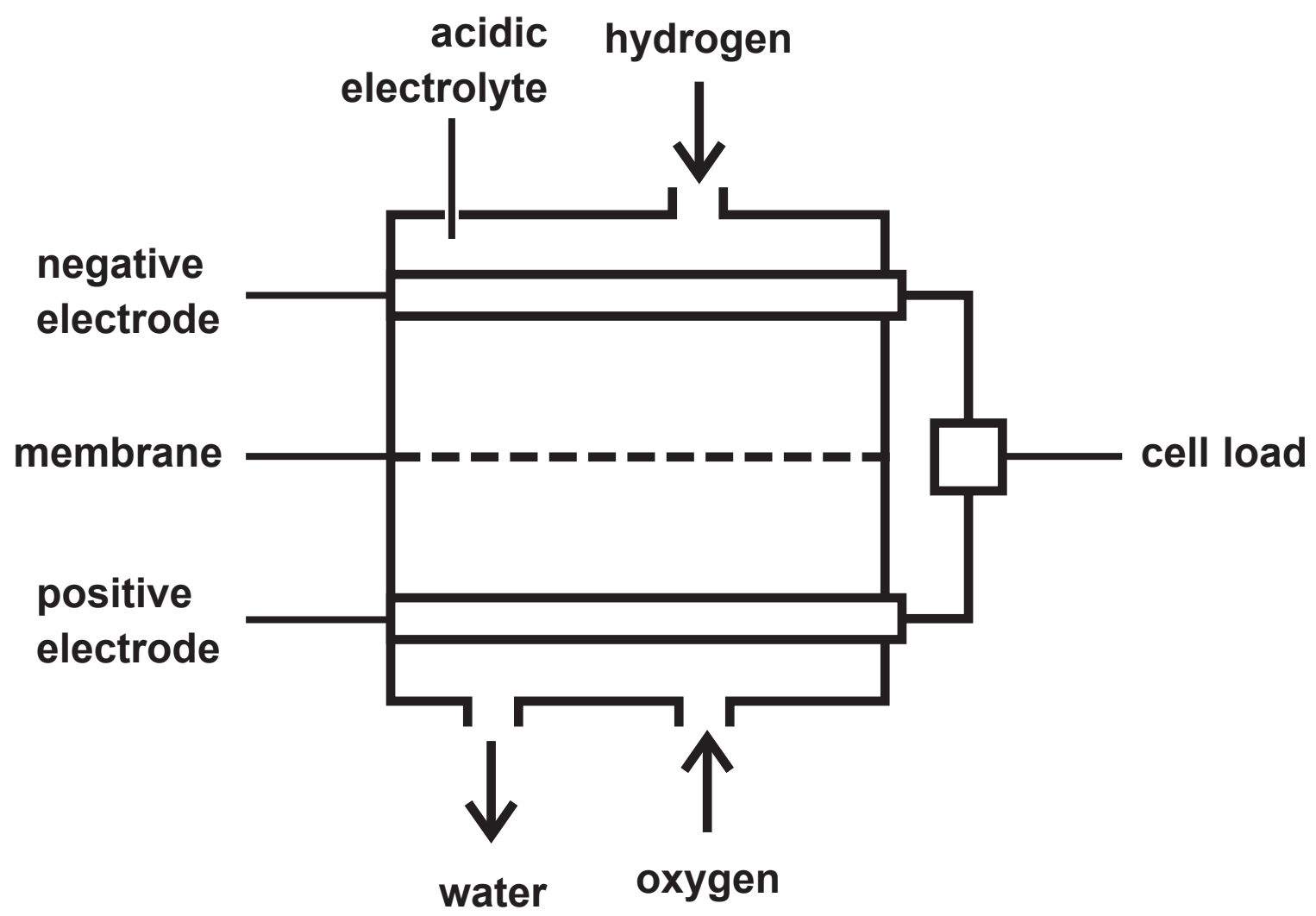
Question 5(a)



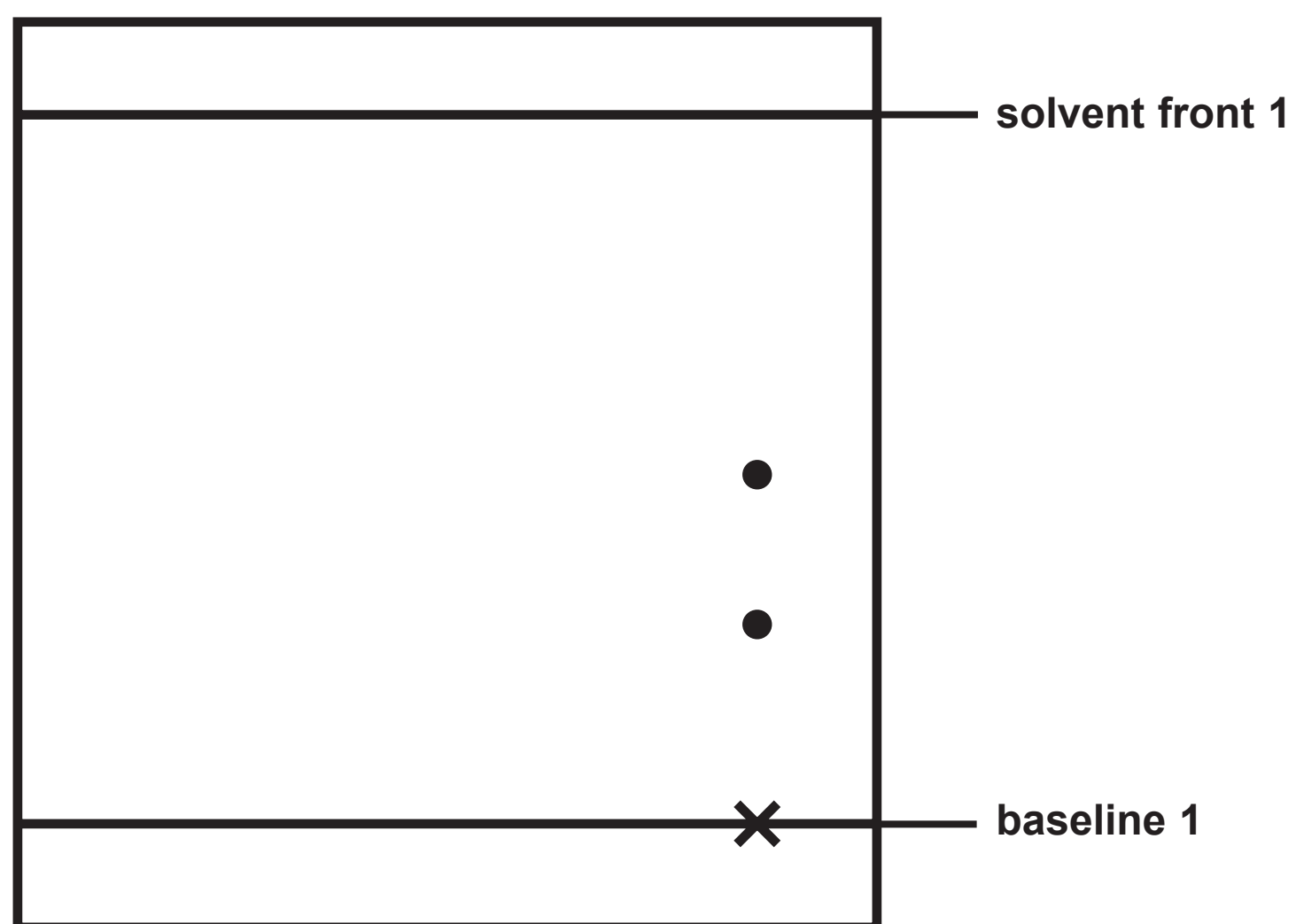
Question 5(b)

Electrode system	E^{\ominus} / 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)



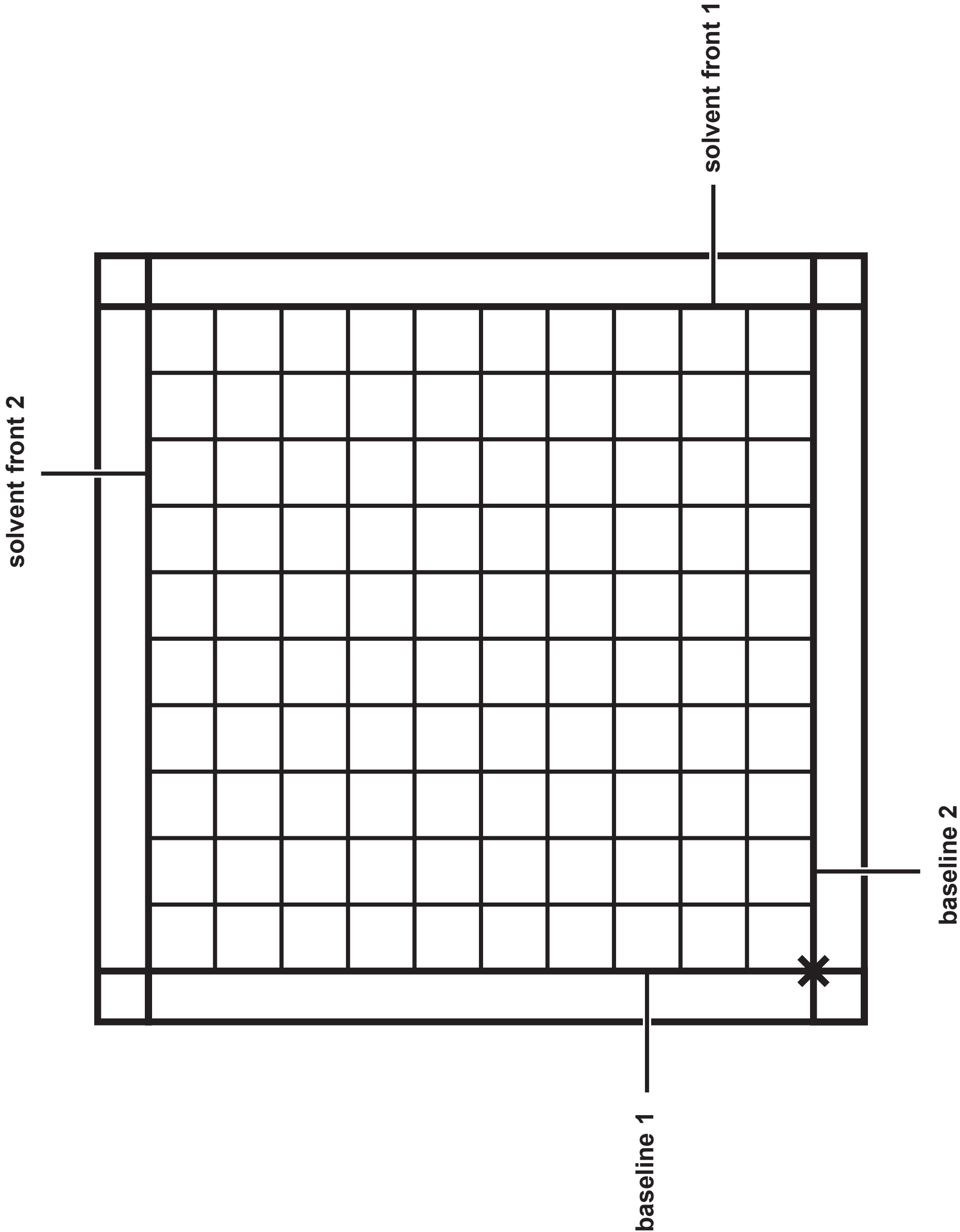
Question 6(b)



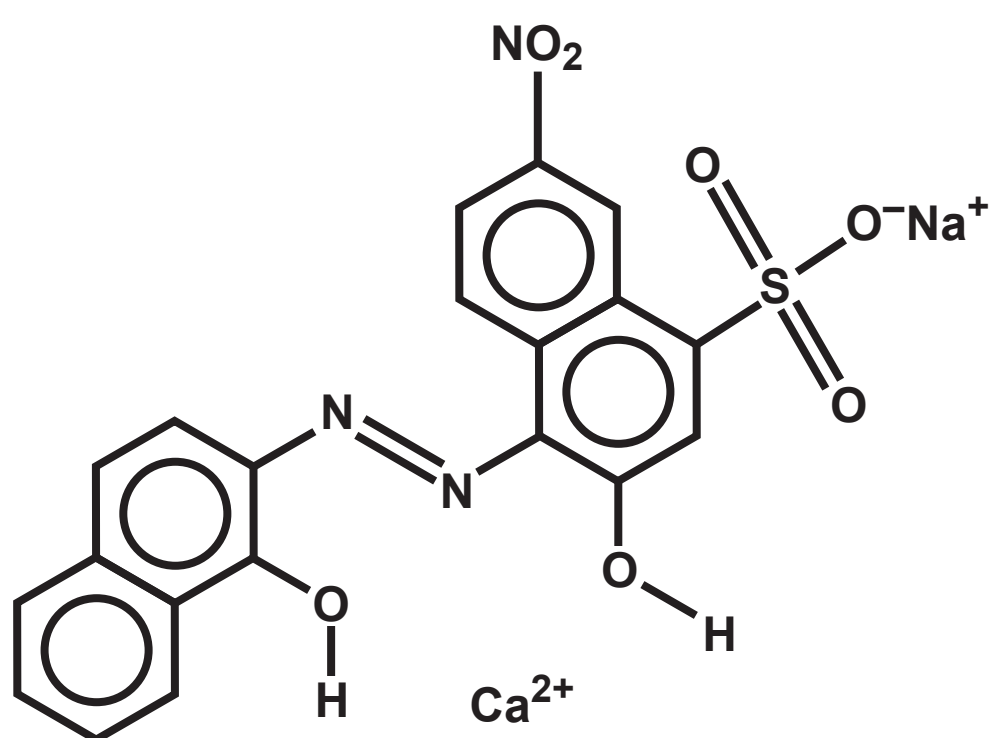
Question 6(b)(ii)

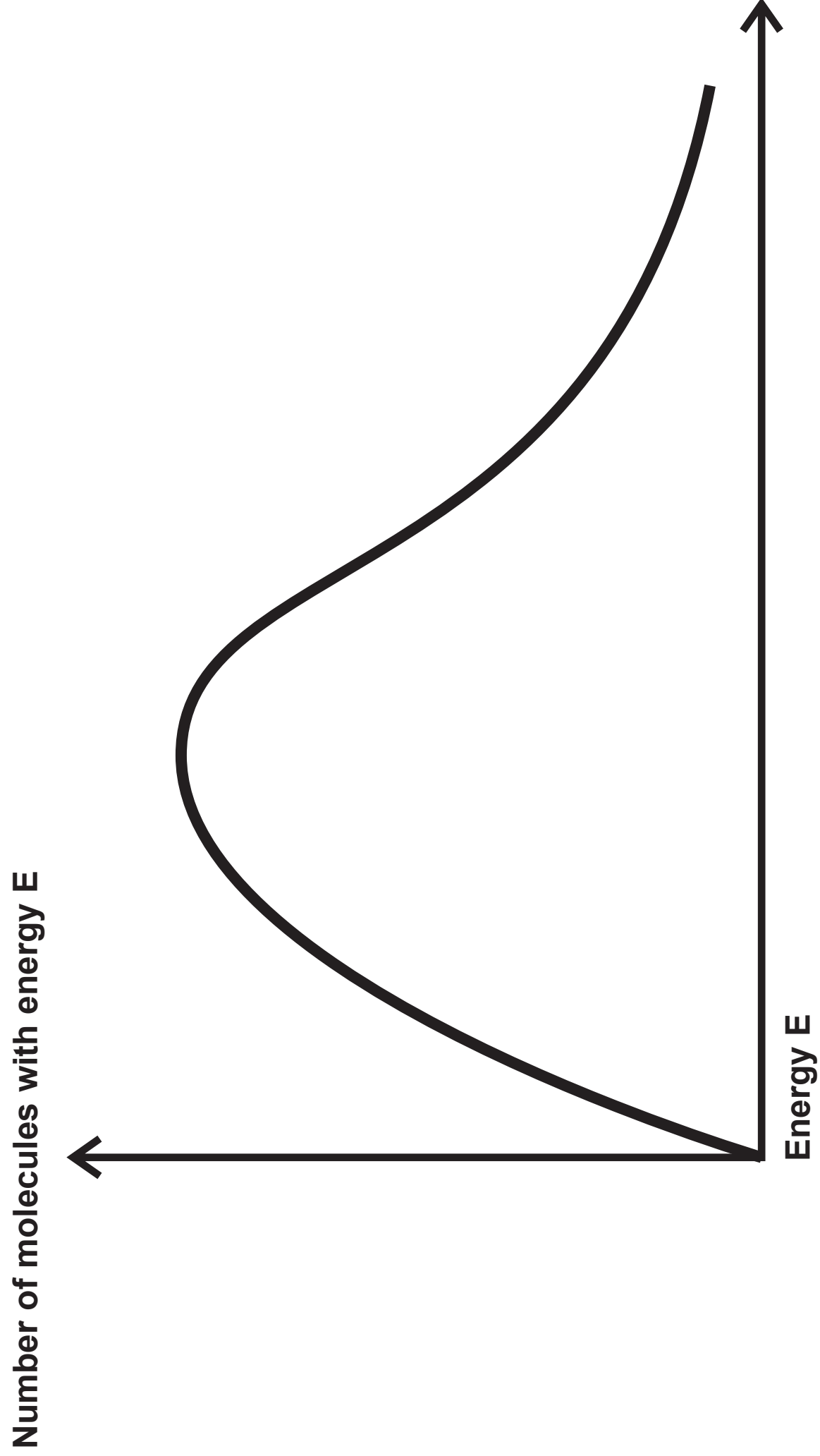
Amino acid	R_f in solvent 1	R_f in solvent 2
alanine	0·38	0·43
glycine	0·33	0·26
valine	0·39	0·58

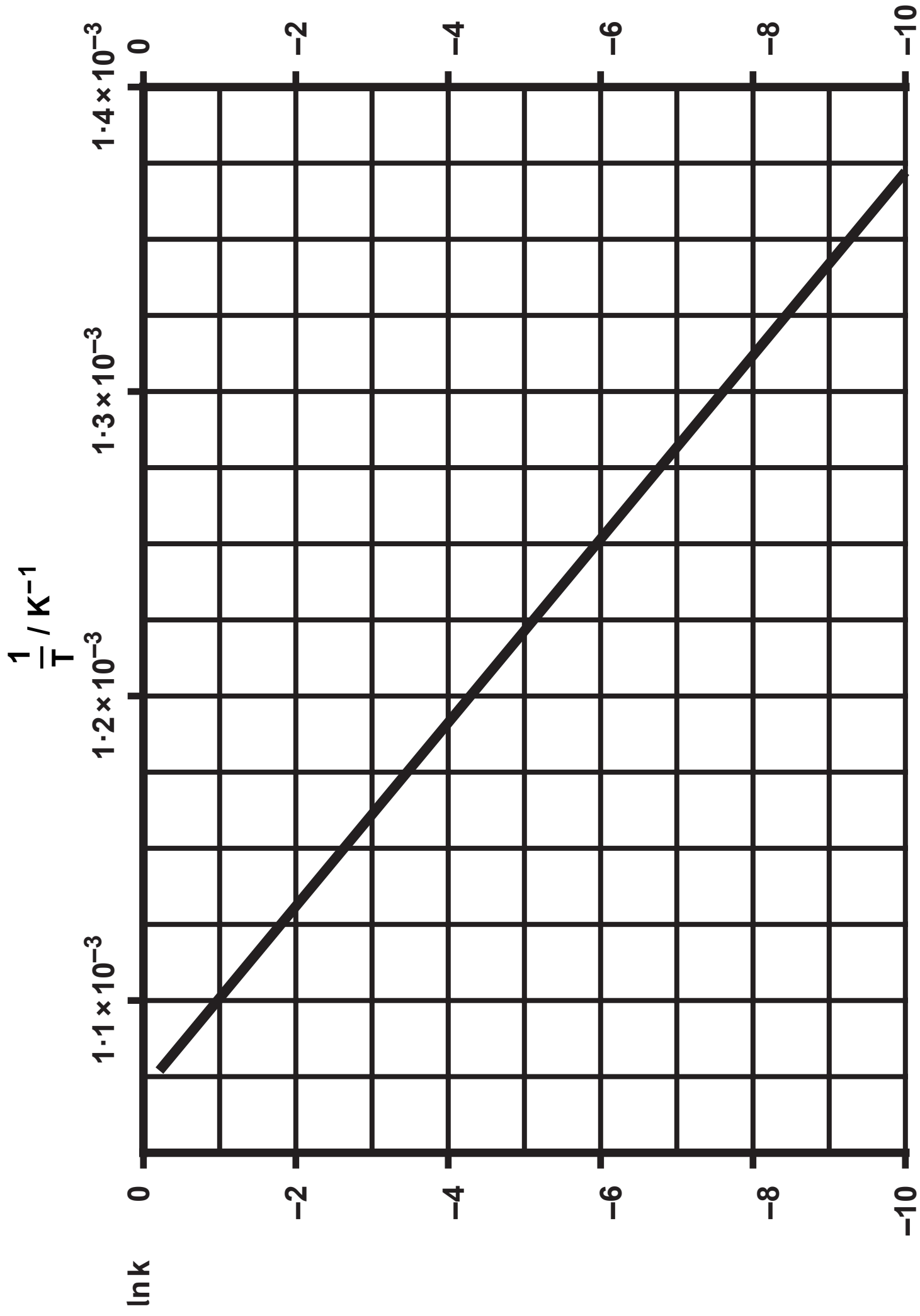
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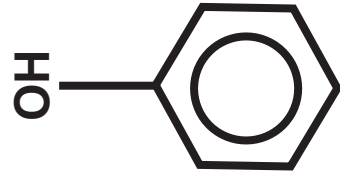
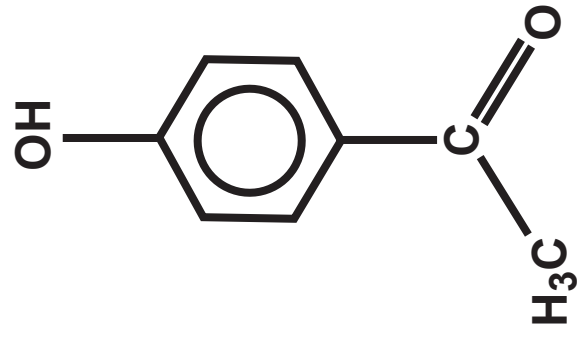


Question 7(c)(i)







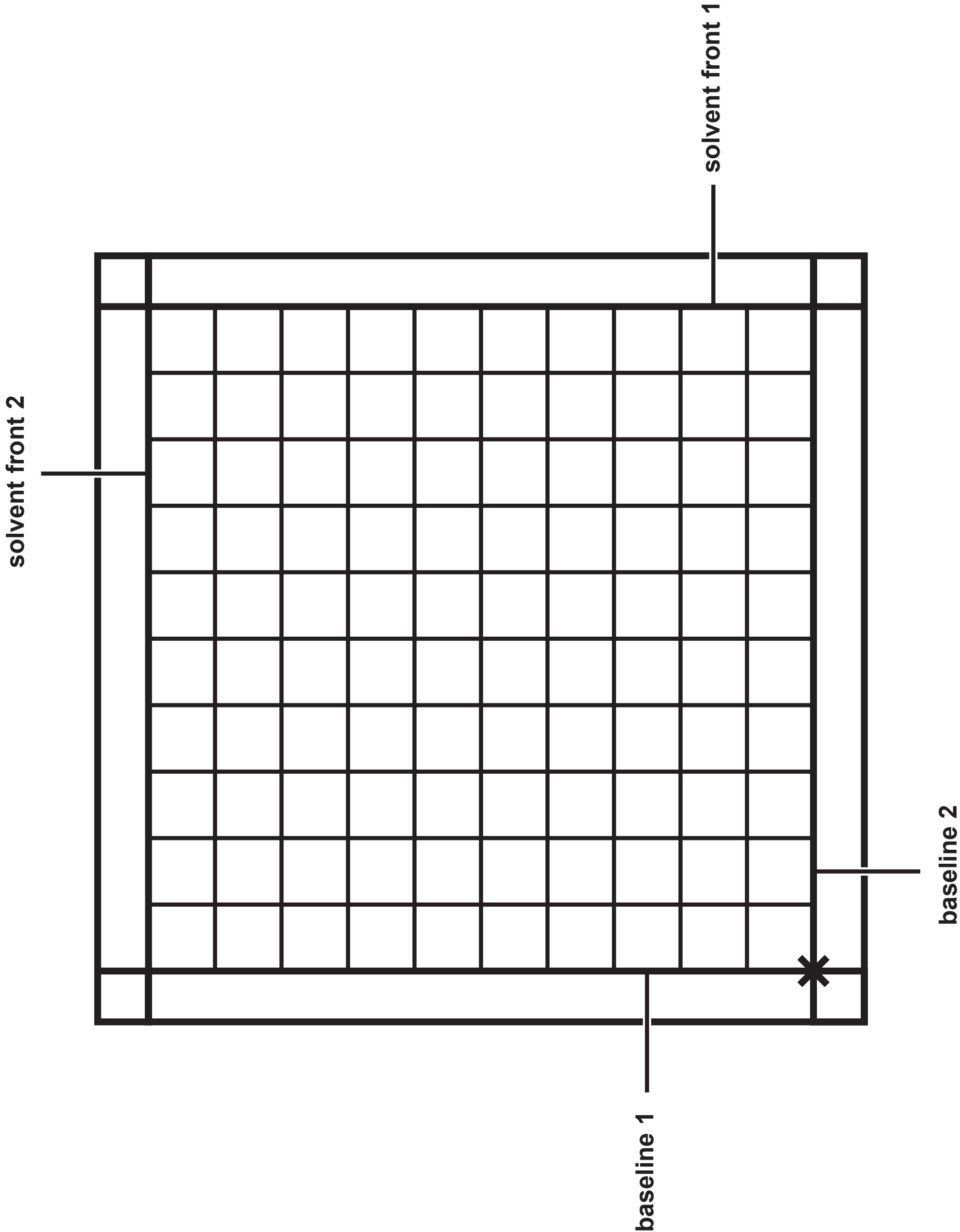


Question 10(b)(i)

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

Question 1(a)





Question 7(c)(i)

