

AQA – Thermodynamics – A2 Chemistry P1

1. June/ 2021/Paper_1/No.7

0 7

This question is about thermodynamics.
Consider the reaction shown.

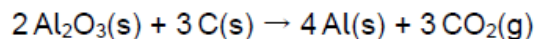


Table 7 shows some thermodynamic data.

Table 7

Substance	Al ₂ O ₃ (s)	Al(s)	C(s)	CO ₂ (g)
$\Delta_f H^\ominus / \text{kJ mol}^{-1}$	-1669	0	0	-394
$S^\ominus / \text{J K}^{-1} \text{mol}^{-1}$	51	28	6	214

0 7 . 1

Explain why the standard entropy value for carbon dioxide is greater than that for carbon.

[1 mark]

0 7 . 2

State the temperature at which the standard entropy of aluminium is $0 \text{ J K}^{-1} \text{ mol}^{-1}$

[1 mark]

0 7 . 3 Use the equation and the data in **Table 7** to calculate the minimum temperature, in K, at which this reaction becomes feasible.

[7 marks]

Minimum temperature _____ K