2 Consider the following process that represents the melting of ice.

$H_2O(s) \longrightarrow H_2O(l)$ $\Delta H^{\ominus} = +6.03\,kJ\,mol^{-1}$, $\Delta S^{\ominus} = +22.1\,J\,K^{-1}\,mol^{-1}$

2 (a) State the meaning of the symbol $^{\ominus}$ in $\Delta H^{\ominus}$.

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(1 mark)

2 (b) Use your knowledge of bonding to explain why $\Delta H^{\ominus}$ is positive for this process.

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(2 marks)

2 (c) Calculate the temperature at which $\Delta G^{\ominus} = 0$ for this process. Show your working.

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(3 marks)

2 (d) The freezing of water is an exothermic process. Give **one** reason why the temperature of a sample of water can stay at a constant value of 0 °C when it freezes.

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(1 mark)

2 (e) Pure ice can look pale blue when illuminated by white light. Suggest an explanation for this observation.

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(2 marks)

9

Turn over ▶