**Marks
2**

- Isooctane, an important constituent of petrol, has a boiling point of 99.3 °C and a standard enthalpy of vaporisation of 37.7 kJ mol^{-1}. What is $\Delta S°$ (in J K^{-1} mol^{-1}) for the vaporisation of isooctane?

At the boiling point, $\Delta_{vap}G° = \Delta_{vap}H° - T\Delta_{vap}S° = 0$. Hence:

$\Delta_{vap}S° = \Delta_{vap}H° / T = (37.7 \times 10^3 \text{ J mol}^{-1}) / (99.3 + 273) \text{ K} = +101 \text{ J K}^{-1} \text{ mol}^{-1}$

Answer: +101 J K^{-1} mol^{-1}