

F325 Synoptic HW3

Part 2

It requires 3.49 kJ of heat energy to convert 1.53 g of liquid water into steam at 373 K and 100 kPa.

- (i) Use these data to calculate the enthalpy change, ΔH , when 1.00 mol of liquid water forms 1.00 mol of steam at 373 K and 100 kPa.

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- (ii) Write an expression showing the relationship between free-energy change, ΔG , enthalpy change, ΔH , and entropy change, ΔS .

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- (iii) For the conversion of liquid water into steam at 373 K and 100 kPa, $\Delta G = 0 \text{ kJ mol}^{-1}$

Calculate the value of ΔS for the conversion of one mole of water into steam under these conditions. State the units.

(If you have been unable to complete part (d)(i) you should assume that $\Delta H = 45.0 \text{ kJ mol}^{-1}$. This is not the correct answer.)

Calculation

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Units

(6 marks)