Do not write outside the box

2 When potassium nitrate (KNO_3) dissolves in water the value of the enthalpy change ΔH = +34.9 kJ mol^{-1} and the value of the entropy change ΔS = +117 J K^{-1} mol^{-1}.

2 (a) Write an equation, including state symbols, for the process that occurs when potassium nitrate dissolves in water.

.....

(1 mark)

2 (b) Suggest why the entropy change for this process is positive.

.....

.....

(1 mark)

2 (c) Calculate the temperature at which the free-energy change, ΔG, for this process is zero.

.....

.....

.....

.....

.....

.....

(3 marks)

2 (d) (i) Deduce what happens to the value of ΔG when potassium nitrate dissolves in water at a temperature lower than your answer to part **2 (c)**.

.....

.....

(1 mark)

2 (d) (ii) What does this new value of ΔG suggest about the dissolving of potassium nitrate at this lower temperature?

.....

.....

(1 mark)

7