22 Enthalpy and entropy

Specification reference	Checklist questions	
5.2.1 a	Can you explain the term *lattice enthalpy* (formation of 1 mol of ionic lattice from gaseous ions, $\Delta_{LE}H$) and use as a measure of the strength of ionic bonding in a giant ionic lattice	☐
5.2.1 b i	Can you use the lattice enthalpy of a simple ionic solid and the relative energy terms to construct Born–Haber cycles?	☐
5.2.1 b ii	Can you use the lattice enthalpy of a simple ionic solid and the relative energy terms to describe related calculations?	☐
5.2.1 c i	Can you explain and use the term enthalpy change of solution?	☐
5.2.1 c ii	Can you explain and use the terms enthalpy change of hydration?	☐
5.2.1 d i	Can you use the enthalpy change of solution of a simple ionic solid and relevant energy terms to construct enthalpy cycles?	☐
5.2.1 d ii	Can you use the enthalpy change of solution of a simple ionic solid and relevant energy terms to describe related calculations?	☐
5.2.1 e	Can you give qualitative explanation of the effect of ionic charge and ionic radius on the exothermic value of a lattice enthalpy and enthalpy change of hydration?	☐
5.2.2 a	Can you calculate pH for strong monobasic acids?	☐
5.2.2 b i	Can you calculate pH for strong bases using K_w?	☐
5.2.2 b ii	Can you calculate pH, K_a or related quantities, for a weak monobasic acid using approximations?	☐

Specification reference	Checklist questions	
5.2.2 c	Can you describe the limitations of using approximations to K_a related calculations for 'stronger' weak acids?	☐
5.2.2 d	Can you explain that the feasibility of a process depends upon the entropy change and temperature in the system, $T\Delta S$, and the enthalpy change of the system, ΔH?	☐
5.2.2 e	Can you explain and calculate the free energy change, ΔG, as: $\Delta G = \Delta H - T\Delta S$ (the Gibbs' equation) and that a process is feasible when ΔG has a negative value?	☐
5.2.2 f	Can you describe the limitations of predictions made by ΔG about feasibility, in terms of kinetics?	☐