

- 3** Some thermodynamic data for fluorine and chlorine are shown in the table.
In the table, X represents the halogen F or Cl

	Fluorine	Chlorine
Electronegativity	4.0	3.0
Electron affinity / kJ mol^{-1}	-348	-364
Enthalpy of atomisation / kJ mol^{-1}	+79	+121
Enthalpy of hydration of $\text{X}^{-}(\text{g})$ / kJ mol^{-1}	-506	-364

- 3 (a)** Explain the meaning of the term *electron affinity*.

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(2 marks)

- 3 (b)** Explain why the electronegativity of fluorine is greater than the electronegativity of chlorine.

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(2 marks)

(Extra space)

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- 3 (c)** Explain why the hydration enthalpy of the fluoride ion is more negative than the hydration enthalpy of the chloride ion.

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(2 marks)



3 (d) The enthalpy of solution for silver fluoride in water is -20 kJ mol^{-1} .

The hydration enthalpy for silver ions is -464 kJ mol^{-1} .

3 (d) (i) Use these data and data from the table to calculate a value for the lattice enthalpy of dissociation of silver fluoride.

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(3 marks)

3 (d) (ii) Suggest why the entropy change for dissolving silver fluoride in water has a positive value.

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(1 mark)

3 (d) (iii) Explain why the dissolving of silver fluoride in water is always a spontaneous process.

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(2 marks)

