2 This table contains some values of lattice dissociation enthalpies.

Compound	$MgCl_2$	$CaCl_2$	MgO
Lattice dissociation enthalpy / kJ mol^{-1}	2493	2237	3889

2 (a) Write an equation, including state symbols, for the reaction that has an enthalpy change equal to the lattice dissociation enthalpy of magnesium chloride.

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(1 mark)

2 (b) Explain why the lattice dissociation enthalpy of magnesium chloride is greater than that of calcium chloride.

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(2 marks)

(Extra space) .....

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2 (c) Explain why the lattice dissociation enthalpy of magnesium oxide is greater than that of magnesium chloride.

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(2 marks)

(Extra space) .....

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2 (d) When magnesium chloride dissolves in water, the enthalpy of solution is –155 kJ mol^{-1}. The enthalpy of hydration of chloride ions is –364 kJ mol^{-1}.

Calculate the enthalpy of hydration of magnesium ions.

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(3 marks)

(Extra space) .....

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2 (e) Energy is released when a magnesium ion is hydrated because magnesium ions attract water molecules.

Explain why magnesium ions attract water molecules.
You may use a labelled diagram to illustrate your answer.

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(2 marks)

2 (f) Suggest why a value for the enthalpy of solution of magnesium oxide is **not** found in any data books.

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(1 mark)

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