

8 This question is about ions and ionic compounds.

(a) The first three ionisation energies of calcium are shown in the table.

	First ionisation	Second ionisation	Third ionisation
Ionisation energy / kJ mol^{-1}	590	1145	4912
Orbital			

(i) Complete the table by identifying the specific orbital from which each electron is removed. (2)

(ii) Write the equation for the **third** ionisation energy of calcium. Include state symbols. (1)

(iii) Explain why the difference between the second and third ionisation energies of calcium is much larger than the difference between the first and second ionisation energies. (2)

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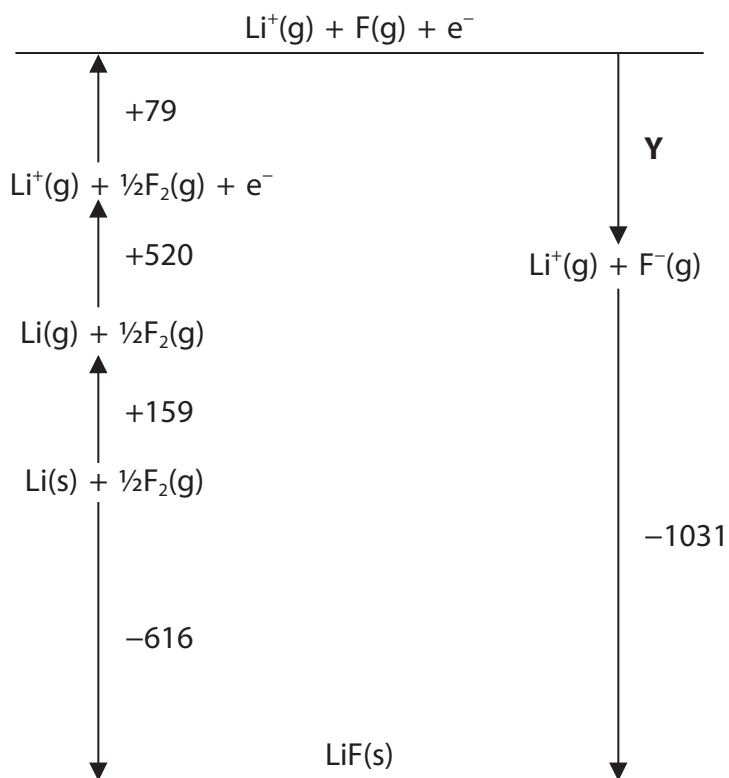


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(b) The diagram, which is not drawn to scale, shows the Born-Haber cycle for lithium fluoride. The energy changes are given in kJ mol^{-1} .



What is the value for **Y**, in kJ mol^{-1} ?

(1)

- A -273
- B -343
- C -432
- D -889



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(Total for Question 8 = 12 marks)

