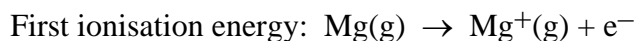


## Electron Arrangement

### First ionisation energies in Group II and Period 3

The first ionisation energy is the energy needed to remove one mole of the outermost electrons from one mole of gaseous atoms of an element, e.g. for magnesium:



#### Your task

1. Complete Tables 1 and 2 below.
2. Plot a graph of first ionisation energy against the proton number,  $Z$ , using the data for group II (Table 1).

Element	Proton number $Z$	first ionisation energy (kJ mol <sup>-1</sup> )
Be		900
Mg		738
Ca		590
Sr		550
Ba		503

Table 1 First ionisation energies for the elements in Group II (Be–Ba)

3. Describe and explain your graph.
4. Plot a graph of first ionisation energy against the proton number,  $Z$ , using the data for the period Na–Ar (Table 2).

Element	Proton number $Z$	first ionisation energy (kJ mol <sup>-1</sup> )
Na		496
Mg		738
Al		578
Si		789
P		1012
S		1000
Cl		1251
Ar		1521

Table 2 First ionisation energies for the elements in period 3 (Na–Ar)

5. Describe and explain your graph.