



1 Give the full electron configuration of the following atoms and ions.

a F atom ..... (1)

b V atom ..... (1)

c  $V^{3+}$  ion ..... (1)

2 Write an equation, including state symbols, to represent the following ionisation energies:

a 1st ionisation energy of potassium ..... (1)

b 2nd ionisation energy of potassium ..... (1)

3 Which group is the following element in? ..... (1)

Ionisation energy	1st	2nd	3rd	4th	5th	6th	7th	8th
$\text{kJ mol}^{-1}$	1310	3390	5320	7450	11000	13300	71000	84100

4 Which element in each of the following pairs has the highest 1st ionisation energy? Explain your answer in each case.

a Na or Mg .....  
.....  
.....  
..... (3)

b P or S .....  
.....  
..... (3)

c Ne or Ar .....  
.....  
..... (3)

d Be or B .....  
.....  
..... (3)