

Electron configurations and the periodic table

1) What is the relationship between the block (s,p,d,f) that the element is in and the valence electrons of that element?

2) What is the relationship between the period number and the number of occupied energy levels for an element?

3) Explain how the electron configuration of phosphorus (P) can be deduced from its position on the periodic table.

Answers:

1)

s block elements have their valence electrons in s orbitals

p block elements have their valence electrons in p orbitals

d block elements have their valence electrons in d orbitals

f block elements have their valence electrons in f orbitals

Example: Be is an s block element – its valence electrons are in the 2s orbital.

2) The period number of an element is equal to the number of occupied main energy levels of the element.

Example: Mg is in period 3 – it has 3 occupied main energy levels.

3) Phosphorus is in group 15 and period 3. It is a p block element with 3 occupied energy levels, therefore its valence electrons will occupy the n=3 sub-level (it will have 2 electrons in the 3s sub-level and 3 electrons in the 3p sub-level).

