

## The Periodic Table

All the known ELEMENTS are listed in the periodic table.

The table shows

i) \_\_\_\_\_

ii) \_\_\_\_\_

iii) \_\_\_\_\_

iv) \_\_\_\_\_

The HORIZONTAL rows of elements are called \_\_\_\_\_

The VERTICAL columns of elements are called \_\_\_\_\_

Elements in the same group all have the same number of \_\_\_\_\_ and so they all have similar \_\_\_\_\_

The elements in group 8 have \_\_\_\_\_ and are found to be \_\_\_\_\_

For this reason, they are called the \_\_\_\_\_ gases.

When elements react, they usually do so in such a way as to obtain in their highest energy level.

The electrons in atoms exist in certain ENERGY LEVELS or SHELLS. The shells are labelled k, l, m etc, where k is the lowest energy level (nearest the nucleus).

Each shell can contain only a certain number of electrons. The maximum number of electrons which a shell can contain is given by the following equation:

$$\text{maximum number of electrons} = 2n^2$$

where n is the number of the shell (for the k shell, n=1, for the l shell, n=2 etc.).

## Questions

1. How many elements are known at the present time?
2. How many of these elements are metals? (Express this answer as a percentage of the total number of elements.)
3. Write down the names and symbols of all the elements which are gases at normal temperatures.
4. Write down the names and symbols of the elements which are liquids at normal temperatures.
5. Find the atomic numbers and names of the following elements:
  - a) He
  - b) Be
  - c) Ga
  - d) Ge
  - e) Co
  - f) As
  - g) Si
  - h) Au
  - i) Li
  - j) I
6. Find the positions in the periodic table of the highly reactive metals sodium, lithium, potassium, caesium.  
Why do you think that these metals are so reactive?
7. Consider the elements in the lists below to react to form compounds.
  - a) calcium reacts with oxygen
  - b) sodium reacts with fluorine
  - c) potassium reacts with bromine
  - d) potassium reacts with oxygen
  - e) iron reacts with sulphur

In each case, decide how many atoms of each element are needed in order to have the stable number of 8 electrons in the outer shell.
8. Using the answer to question 7 write down the formulae of the following compounds:
  - a) calcium oxide
  - b) sodium fluoride
  - c) potassium bromide
  - d) potassium oxide
  - e) iron sulphide