

## Chemical Formulae

- ❓ A compound is represented in the abbreviated form by chemical formula.
- ❓ The chemical formula of a compound represents the composition of a molecule of the compound in terms of the symbols of the elements present in it.

**Ex.** Water is a compound made up of 2 atoms of hydrogen element and 1 atom of oxygen element, so the formula of water is written as  $\text{H}_2\text{O}$ . In the formula  $\text{H}_2\text{O}$ , the subscript 2 indicates 2 atoms of hydrogen. In the formula of water, oxygen O is written without a subscript and it indicates 1 atoms of oxygen.

### Formulae of elements

- ❓ The chemical formula of an element is a statement of the composition of its molecule in which symbol tells us the element and the subscript tells us how many atoms are present in one molecule. One molecule of hydrogen element contains two atoms of hydrogen, therefore, the formula of hydrogen is  $\text{H}_2$ .

**Ex.** The formula  $\text{H}_2$  indicates that one molecule of hydrogen element contains 2 atoms of hydrogen.  $2\text{H}$  represents 2 separate atoms of hydrogen;  $\text{H}_2$  represents 1 molecule of hydrogen and  $2\text{H}_2$  represents 2 molecules of hydrogen.

### Formulae of compounds

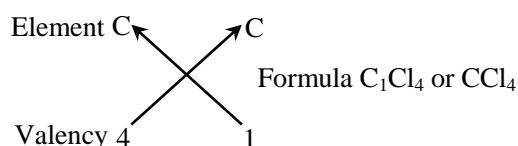
- ❓ The chemical formula of a compound is a statement of its composition in which the chemical symbols tell us which elements are present and the subscripts tell us how many atoms of each element are present in one molecule of the compound.

**Ex.** Water is a compound whose molecule contains 2 atoms of hydrogen and 1 atom of oxygen. So, the formula of water is  $\text{H}_2\text{O}$ .

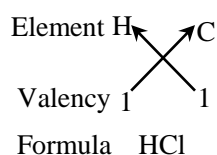
### Rules for writing a chemical formula

- ❓ We first write the symbols of the elements which form the compound
- ❓ Below the symbol of each element, we write down its valency.
- ❓ Finally, we cross-over the valences of the combining atoms. That is, with first atom we write the valency of second atom (as a subscript); and with the second atom we write the valency of first atom (as subscript).

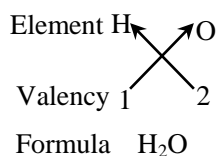
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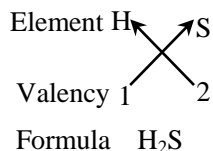
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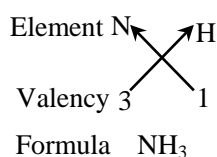
**Ex.**



**Ex.**



**Ex.**



### Writing the formula of a compound

#### Step-1 :

Write the symbols of formulae of the ions of the compound side by side with positive ion on the left hand side and negative ion on right hand side.

#### Step-2 :

Enclose the polyatomic ion in a bracket.

#### Step-3 :

Write the valency of each ion below its symbol

#### Step-4 :

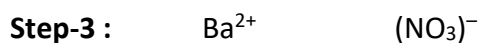
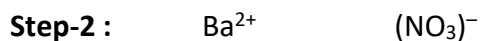
Reduce the valency numerals to a simple ratio by dividing with a common factor, if any.

#### Step-5 :

Cross the valencies. Do not write the charges positive or negative of the ions.

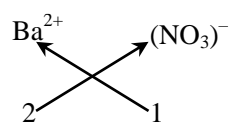
**Ex.** Formula of barium nitrate.

#### Step-1 : Writing the formula of the ions :



**Step-4 :** Not applicable, because ratio is already simple

**Step-5 :**



Thus, the formula of barium nitrate is  $\text{Ba}(\text{NO}_3)_2$