

Oxoacid

An **oxoacid** is an acid that contains oxygen. To be more specific, it is an acid that:

1. contains oxygen
2. contains at least one other element
3. has at least one hydrogen atom bound to oxygen
4. forms an ion by the loss of one or more protons.^{Boric}

The name **oxyacid** is sometimes used, although this is not recommended.

Generally, oxoacids are simply polyatomic ions with a positively polarized hydrogen, which can be split off as a cation(ion).

Under Lavoisier's original theory, all acids contained oxygen, which was named from the Greek οξύς (*oxys*) (acid, sharp) and γεινομαι (*geinomai*) (engender). It was later discovered that some acids, notably hydrochloric acid, did not contain oxygen and so acids were divided into oxoacids and these new hydracids.

Examples of oxoacids:

- Carboxylic acids
- Sulfuric acid
- Nitric acid
- Phosphoric acid
- Halogen oxoacids: Hypochlorous acid; Chlorous acid; Chloric acid; Perchloric acid; Perbromic acid; Metaperiodic acid

Examples of non-oxoacids (hydracids):

- Hydrochloric acid
- Hydrofluoric acid
- Hydrobromic acid
- Hydroiodic acid
- Hydrocyanic acid

All oxoacids have the acidic hydrogen bound to an oxygen atom, so bond strength (length) is not a factor, as it is with binary nonmetal hydrides. Rather, the electronegativity of the central atom (E) and the number of O atoms determine oxoacid acidity. With the same central atom E, acid strength increases as the number of oxygen attached to E increases. With the same number of oxygens around E, acid strength increases with the electronegativity of E.

Imidic Acids are created by replacing =O with =NR in an Oxoacid.^[1]

Note

1. This final criterion has the effect of excluding boric acid from the strict definition, as it forms its anion by addition of hydroxide rather than loss of a proton: $\text{B(OH)}_3 + \text{H}_2\text{O} \rightleftharpoons [\text{B(OH)}_4]^- + \text{H}^+$. However, boric acid is usually considered to be an oxoacid nonetheless.

References

[1] <http://goldbook.iupac.org/I02949.html>

External links

- oxoacids (<http://goldbook.iupac.org/O04374.html>) IUPAC definition of "oxoacid" (<http://www.iupac.org/goldbook/O04374.pdf>) (from the "*Gold Book*")

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