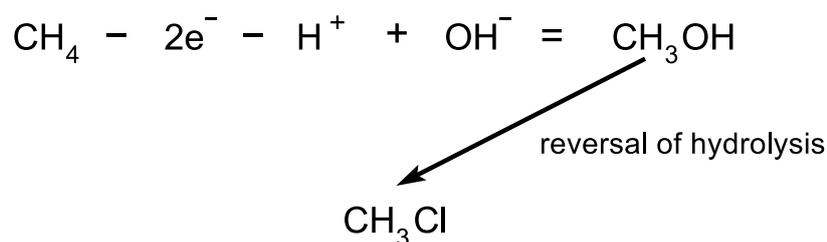


oxidation

1. The complete, net removal of one or more electrons from a molecular entity (also called 'de-electronation').
2. An increase in the oxidation number of any atom within any substrate.
3. Gain of oxygen and/or loss of hydrogen of an organic substrate.

All oxidations meet criteria 1 and 2, and many meet criterion 3, but this is not always easy to demonstrate. Alternatively, an oxidation can be described as a transformation of an organic substrate that can be rationally dissected into steps or primitive changes. The latter consist in removal of one or several electrons from the substrate followed or preceded by gain or loss of water and/or hydrons or hydroxide ions, or by nucleophilic substitution by water or its reverse and/or by an intramolecular molecular rearrangement. This formal definition allows the original idea of oxidation (combination with oxygen), together with its extension to removal of hydrogen, as well as processes closely akin to this type of transformation (and generally regarded in current usage of the term in organic chemistry to be oxidations and to be effected by 'oxidizing agents') to be descriptively related to definition 1. For example the oxidation of methane to chloromethane may be considered as follows:



Source:

PAC, 1994, 66, 1077 (*Glossary of terms used in physical organic chemistry (IUPAC Recommendations 1994)*) on page 1148