

1 Oxidation

1.1 Overview

1.1.1 Application

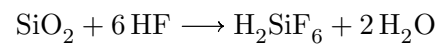
Oxides in semiconductor industry are used for multiple reasons:

- isolation (interlayer dielectric, ...)
- scatter oxide (ion implantation)
- adaption layers (locos technology, ...)
- planarization (edge rounding, ...)
- mask layer (diffusion, ...)
- alignment marks (lithography)
- cover layer (to prevent corrosion, ...)

1.1.2 Properties of oxide layers

In combination with silicon, oxide appears as silicon dioxide SiO_2 . It can be deposited in very thin, electric stable, and uniform layers.

Silicon dioxide, or just dioxide, is very resistant and can only be etched by hydrofluoric acid HF. Water or other acids don't affect oxide; because of metal ions, alkaline lye (KOH, NaOH) can't be used (both KOH and NaOH in contrast are important for anisotropic wet etch in micromechanics). The chemical reaction of dioxide and HF is as follows:



Beside this, oxide is applicable for integrated circuits because it meets the electric requirements (e.g. gate oxide, interlayer dielectric, field oxide).