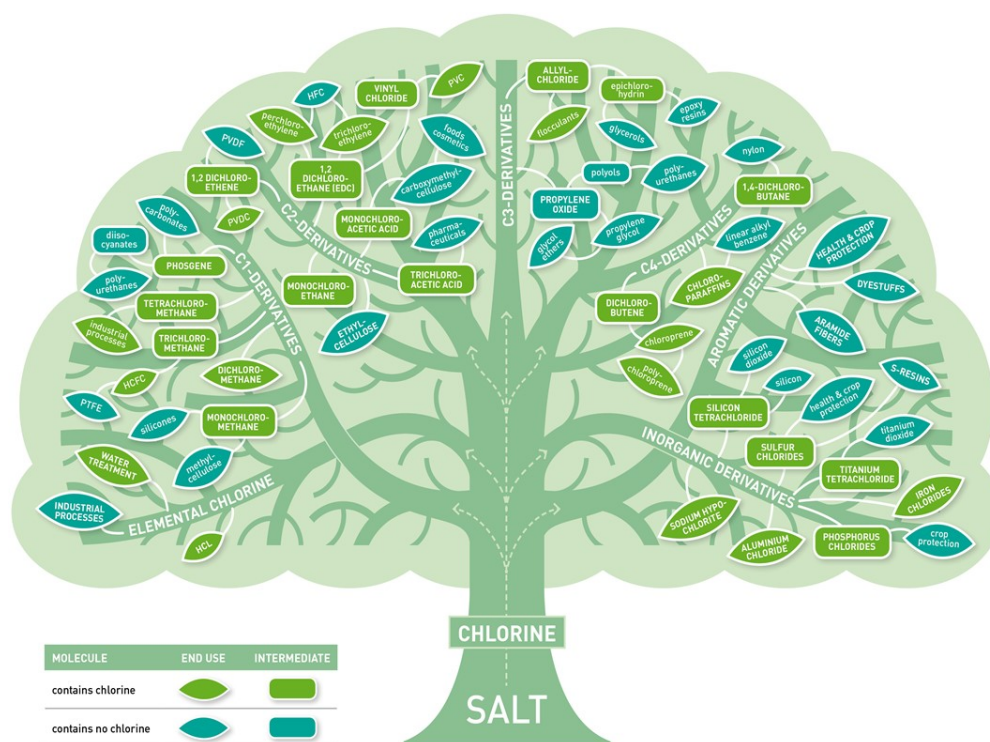


The chlorine tree

Chlorine is a major building block in modern chemistry

Whether you insulate a house, make synthetic rubber, use microchips or solar cells, purify waste water or simply apply some deodorant, chlorine is always involved. Based on simple table salt, chlorine is a major building block in modern chemistry. Many of these products don't contain the chlorine itself, but chlorine and chlorinated substances are used in many hundreds of production processes. Some examples of applications are shown in the chlorine tree.



✱ Aluminium chloride

A major industrial catalyst. It accelerates chemical reactions used to make medicines, paints, rubber, lubricants, wood preservatives, the plastic polystyrene (through its use in production of ethylbenzene to make the styrene) and detergents.

✱ Aramide fibers

Aramid fibers (aromatic polyamide) are a class of heat-resistant and superstrong synthetic fibers used in aerospace and military applications, for body armor fabric, in bicycle tyres and as a substitute for asbestos.

✱ Carboxymethylcellulose

An acid derivative of cellulose that is the chief constituent of all plant tissues. It is used in food science as a thickener and to stabilize emulsions including ice cream. It is also a constituent

of toothpaste, laxatives, diet pills, water-based paints, detergents, textile sizing and various paper products.

✱ Chlorinated alkanes

Chlorinated alkanes or paraffins (CPs) are straight-chain hydrocarbons that have been chlorinated. The largest application is as a plasticiser in flexible PVC and in paints, sealants and adhesives.

✱ Chloroprene

A synthetic rubber with properties such as good mechanical strength, high ozone and weather resistance, aging resistance, low flammability and chemical resistance.

✱ Dichloromethane

A chlorinated solvent, largely used in pharmaceutical production.



✱ **Dyestuffs**

Intensely coloured complex organic compounds used to colour textiles, leather, paper and other materials. Indigo (jeans) is an example of one such dye.

✱ **Epoxy resins**

Epoxy resins make excellent adhesives and are one of the few adhesives that can be used on metals. They are also used for protective coatings, in electronic circuit boards and for patching holes in concrete pavement.

✱ **Ethylcellulose**

Water-insoluble polymer used in controlled-release pharmaceuticals.

✱ **Flocculants**

Flocculants consist of various polymers and are used to increase the efficiency of waste water purification (see iron chloride).

✱ **Glycerol**

Also called glycerin is a viscous liquid that is widely used in pharmaceutical formulations and food preparations.

✱ **Glycol ethers**

Solvents used in cleaning compounds, liquid soaps, cosmetics.

✱ **HCFC**

Hydrochlorofluorocarbons used as a precursor to polytetrafluoroethylene (e.g. Teflon®).

✱ **HCl**

Hydrochloric acid, the solution of hydrogen chloride (HCl) in water. A corrosive, strong mineral acid with major industrial uses. It is also found naturally in gastric acid.

✱ **HFC**

Hydrofluorocarbons, used as refrigerants and foam propellants.

✱ **Iron chloride**

Ferrous chloride (FeCl₂) and ferric chloride (FeCl₃) serve as flocculating agents in wastewater treatment.

✱ **Linear alkyl benzene**

An intermediate in detergent production.

✱ **Methylcellulose**

Derived from plant cellulose and used as a thickener and emulsifier in various food and cosmetic products

✱ **Nylon**

Polyamide, a family of one of the most commonly used polymers (e.g. for fabrics).

✱ **Perchloroethylene**

Chlorinated solvent typically used in dry-cleaning.

✱ **Polycarbonate**

Synthetic polymer used for e.g. car lamps, CDs and DVDs.

✱ **Polychloroprene**

A family of synthetic rubbers produced by polymerization of chloroprene.

✱ **Polyurethane**

A family of synthetic polymers used as foams (insulation, seats, mattresses, shoe soles etc.) or in its hard form (e.g. ski boots).

✱ **Propylene glycol**

Or 1,2-propanediol, an alcohol used in brake and hydraulic fluid and as industrial antifreeze.

✱ **PTFE**

Polytetrafluoroethylene (e.g. Teflon®), a synthetic resin with many applications, from non-stick material on cookware to lubricants.

✱ **PVC**

Polyvinyl chloride, popular synthetic polymer used in construction (door and window frames, flooring material), car dashboards, flexible hoses, water piping, cling film, toys and many more!

✱ **PVDC**

Polyvinylidene dichloride, a high-tech plastic, used in the form of films or fibres.

✱ **PVDF**

PVDF is a specialty plastic of the fluoropolymer family; it is used generally in applications requiring the highest purity, strength and resistance to solvents, acids, bases and heat.

✱ **Silicon**

Chemical element (symbol Si and atomic number 14). Chlorine is used to produce high-purity silicon for solar cells.

✱ **Silicon dioxide**

SiO₂ also found in sand. Raw material for silicon production.

✱ **Sodium hypochlorite**

Has been used for centuries for bleaching and disinfecting. Commonly found in household bleach. Formula NaOCl.

✱ **s-Resins**

Chemically inert, low coloured, water repellent resins used as additives in the rubber industry.

✱ **Titanium dioxide**

A widely used, white pigment for cosmetics, paper, paint etc. Chlorine is used to purify the titanium dioxide from its minerals.

✱ **Trichloroethylene**

A chlorinated solvent used as feedstock to produce fluorinated hydrocarbons (e.g. for use in refrigeration) and fluorinated polymers and as an industrial solvent in various applications.

Much more about chlorine, as well as our interactive chlorine, caustic soda and caustic potash trees at www.eurochlor.org.

Chlorine chemistry applications: www.chlorinethings.eu

