250 years of improving lives with chlor-alkali chemistry

This year marks the 250th anniversary of Karl Wilhelm Scheele's discovery of chlorine: a significant milestone in the history of chemistry.

Together with its co-products sodium/potassium hydroxide (caustic soda/ potash) and hydrogen (collectively known as chlor-alkali), this basic chemistry is the foundation of a modern industry, shaping products and technologies that have contributed to public health, industrial growth, and sustainability.

Here is a short history of this fascinating chemistry!

18th century

Chlorine is discovered

Karl Wilhelm Scheele discovers chlorine

- Electrolysis of salt water to produce chlorine and sodium hydroxide (caustic soda) is demonstrated
- First small-scale use in bleach, soap and textiles

19th century

Large-scale alkali production processes are developed

- New processes enable large-scale production of alkali for glass, textiles and soap and then for the chemical industry
- Further upscaling during the century for even more bleach, soaps and detergents

19th-20th century

Chlorine plays a key role in water sanitation

revolutionizing public health through the reduction of waterborne diseases

- Chlorine first used to treat the water supply of a city (Jersey City, USA) [1909]
- First regular treatment of swimming pool water (Brown University, Rhode Island) [1910]
- Chlorine first used to treat the water supply of a town (Maidstone, England) [1897]

20th century

Innovative applications for chlor-alkali expand

- Polyvinyl chloride (PVC) developed for pipes, construction materials, packaging, and even medical devices such as blood bags
- Strong synthetic fibres such as nylon and Kevlar®
- Polyurethane for insulation, coatings, and foams
- Pharmaceuticals, where chlorine is used in the production of over 85% of modern medicines such as antibiotics, painkillers and antiseptics

21st century

Chlor-alkali is a major contributor to sustainable solutions

- Chlor-alkali materials help make solar panels, wind turbines, and electric vehicle batteries
- Chlorine continues to play a vital role in water sanitation and particularly in developing regions where access to clean water is limited, to help meet global sustainable development goals
- Advances in technology enable even more recycling of PVC
- Hydrogen, one of the key products generated during the chlor-alkali process, gains importance as a clean energy carrier

CHLORINE 250

YEARS OF IMPROVING LIVES WITH CHLOR-ALKALI CHEMISTRY

The World Chlorine Council is leading the way

Who is working to make these advancements a reality? The World Chlorine Council (WCC) and its regional membership. Founded in the early 1990s by the US and Europe associations, WCC is a global chlor-alkali network bringing together six regional associations, all founded in just over 100 years.

SAFETY

Holding regular global safety workshops since 2002 to promote the continuous improvement of safety practices worldwide in the production, transportation and use of chlor-alkali

COMMUNICATION

Participating in UN Water Conferences in 2023 and supporting annual World Water and World Oceans Days.

ENGAGEMENT

Supporting the UNEP Global Mercury Partnership and Minamata Conventions since 2016 to phase out mercury in chlor-alkali by 2025.

SUSTAINABILITY

Publishing a Sustainability Report since 2002.

COMMUNICATION

Providing resources to help communities safely use bleach to battle hepatitis A, norovirus, COVID-19, dengue fever and Monkey Pox.

SAFETY

Sharing of safety incidents and best practice guidance at every WCC meeting and in newsletters.

ENGAGEMENT

Collaborating with global organizations such as the Strategic Approach to International Chemicals Management (SAICM), World Health Organization (WHO) and Organisation for Economic Cooperation and Development (OECD).

SUSTAINABILITY

Communicating on how chlor-alkali helps the UN Millennium Development Goals and UN Sustainable Development Goals.

COMMUNICATION

Showing the benefits of chlor-alkali with chlorine and caustic soda 'trees' via the worldchlorine.org website and @ChlorineWorld LinkedIn and X accounts.

ENGAGEMENT

Promoting safe clean drinking water at Water Forums in India in 2015, South Africa in 2019 and Latin America in 2023.

SUSTAINABILITY

Participating in World Summits and UN Conferences on Sustainable Development.

COMMUNICATION

Contributing to the Working Groups of Stockholm Convention on Persistent Organic Pollutants (POPs).

ENGAGEMENT

Contributing to global guidance on Waste and High-Production Volume chemicals.