Chlorine & Derivatives Production

2 days **RPC/FABCL-E**

Overview

LEVEL

Awareness

PURPOSE

This course brings technical information on the production, the main industrial applications and the uses of chlorine compounds.

LEARNING OBJECTIVES

Upon completion of the course, the participants will be able to:

describe the origin, the outlets and the applications of chlorine compounds and also of the products using chlorine in their production chain,

understand the structure and the role of the industry of chlorine and main derivatives,

analyze the principle of the various processes of production for chlorine and some of its derivatives.

WAYS AND MEANS

The content of this course can be adapted to client needs.

LEARNING ASSESSMENT

Quiz.

PREREQUISITES

No prerequisites for this course.

Agenda

ORIGIN & USES OF CHLORINE & ITS DERIVATIVES — 0.25 d

Natural chlorine: various natural forms, salts, chlorides, minerals…
Chlorine in daily life: factor of health, hygiene and cleanliness. Raw material for staples.
Overview of chlorine and derivative uses in France and worldwide.
Main raw material: the salt (sodium chloride), availability and distribution.

PRODUCTION PROCESSES FOR CHLORINE & DERIVATIVES — 0.75 d

Preparation of brine: extraction of sea salt and “gemme” salt. Purification and filtration processes of brine, quality criteria.
Electrolysis:
Generalities on electrolysis process, rules of proportions for production.
Industrial implementation of the process. Membrane electrolysis workshop: diaphragm and mercury.
Recent evolution of the various means of production.
Operating conditions of these various workshops and specific consumption of electrical energy.
Safety and pollution prevention in the workshops.
Chlorine treatment:
Chlorine desiccation, compression and liquefaction.
Storage and transport of liquid chlorine.
Safety and elimination of chlorinated effluents. Management of bleach workshop, inert treatment.

Hydrogen treatment: cooling, desiccation, demercurization and uses.
Concentration and soda treatments: various processes.

VINYL CHLORIDE & PVC MANUFACTURING

0.5 d

Generalities on the various DCE production processes: direct chlorination, balanced process, oxychlorination.
Industrial implementations: catalysts, fixed or fluidized beds.
CVM production by pyrolysis: DCE cracking, by-product separation and CVM purification.
Flexibility of the processes and integration depending on various schemes to minimize the production of chlorhydric acid and the consumption of energy.
CVM polymerization.
Generalities of industrial polymerization processes: main steps, exothermicity, polymer purification, shaping.
Various processes and industrial constraints: polymerization in emulsion, in suspension, in mass.

PRODUCTION OF SOME OTHER CHLORINE DERIVATIVES

0.25 d

Bleach, protection products, catalysts, chlorinated solvents, frigorific fluids.

ECONOMICS OF THE CHLORINE INDUSTRY

0.25 d

Production cost structure.
Costs related to the supply of salt and electrical energy.
Market trends and international integration.
Recycling of chlorinated products.