

CHLORINE DIOXIDE (ClO₂)

GENERAL

Production of fully bleached kraft pulp usually requires two chlorine dioxide stages. The chlorine dioxide is produced on-site by reacting (a) sodium chlorate with sulphuric acid and sulphur dioxide (Mathieson process); (b) sodium chlorate/sodium chloride solution with sulphuric acid (ERCO R-2, R-3 process and Hooker SVP process); or (c) sodium chlorate with methanol (Solvay process).

Chlorine dioxide gas has a pungent, irritating odour similar to that of chlorine or nitrogen dioxide. At kraft mills, emissions to work areas occur due to leaks in the ClO₂ generator; "puffs", when impurities are present or mixtures of chlorine dioxide and air in the generator exceed the spontaneous explosive limit; spills of bleached stock, and leaks from valves, pumps, and seals.

A special analysis procedure is needed to distinguish chlorine dioxide from chlorine. Using this method, concentrations measured in the bleach plants at seven B.C. kraft mills in 1979-1981 were invariably below the detection limit of 0.01 ppm. Inside D-stage washer hoods concentrations up to 60 ppm were measured.