

Direct Oxidation Manufacture of Epichlorohydrin

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Brief technical note

The traditional process of manufacturing epichlorohydrin involves the chlorination of propylene in a three-step process: high-temperature chlorination of propylene to produce chloropropene, hypochlorination of chloropropene to produce dichloropropanol, and saponification of dichloropropanol to produce epichlorohydrin. The process is extensively covered in PEP Report 58 *Glycerin and Intermediates* (December 1969). This classic epichlorohydrin synthesis process has a 70-year history. However, the yield is low, and the utilization rate of chlorine atoms is only about 25%. Moreover, a large amount of chlorine-containing wastewater and calcium chloride residues are generated during the reaction, leading to serious environmental pollution. About 40 metric tons of chlorine-containing wastewater is produced per metric ton of epichlorohydrin in this process. PEP Review 2007-4 *Epichlorohydrin from Glycerin* (August 2007) covers the second route for manufacturing epichlorohydrin. Also known for decades, in this route, glycerin is made to react with hydrochloric acid (HCl) to form an intermediate dichlorohydrin, which can then be converted to epichlorohydrin.

This technical note covers the direct oxidation route for producing epichlorohydrin using hydrogen peroxide as a feasible alternative to the glycerin route.

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