Safety around hydrogen

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ABSTRACT

Hydrogen is a trace compound in chlorine produced in chlorine-alkali electrolysis. When concentrated in the gas phase, the hydrogen concentration in chlorine gas can exceed the Lower explosion limit (LEL). Above the LEL the mixture is explosive and above the detonation limit the mixture can detonate resulting in pressures up to 50 times the initial pressure.

This hazard is explained during normal operation, starting and stopping of the electrolysis. The hazard can occur in the electrolysis and in the downstream processing. Several failure scenarios in the electrolysis and in the downstream units can result in hydrogen concentration exceeding the LEL.

The risk of loss of containment due to explosion of hydrogen in chlorine must be sufficiently reduced. Well established measures in design, operation, and safeguarding to reduce this risk are presented.

Keywords:

Safety, Hydrogen