



August 4, 2023

Subject: Detrex Route of Synthesis Statement

To whom it may concern,

Detrex Hydrochloric acid (HCl) produced at their Ashtabula facility is synthesized through a direct synthesis method, which involves the reaction between hydrogen gas (H₂) and chlorine gas (Cl₂). Liquid Hydrogen is vaporized into a gas and simultaneously fed into graphite reaction vessel with Chlorine gas. The two gases react, producing a high concentration gaseous mixture of hydrogen chloride. This mixture is dissolved into high purity water to produce hydrochloric acid. The generated hydrochloric acid solution is then diluted to strength by the addition of additional high purity water as needed to meet specification. This process ensures a high-quality product suitable for pharmaceutical, food and various industrial and laboratory applications.

The direct synthesis of hydrochloric acid can be represented by the following balanced chemical equation: $H_2 + Cl_2 \rightarrow 2HCl$

The reaction is exothermic, meaning it releases heat during the process. As a result, careful temperature control is necessary to maintain optimal reaction conditions.

To synthesize its hydrochloric acid products Detrex uses pure Hydrogen and Chlorine. As a result, the Detrex process requires no additional catalysts, such as activated carbon, metal oxides, or transition metal chlorides to promote the formation of HCl molecules from hydrogen and chlorine atoms.

Sincerely,

A handwritten signature in black ink that reads "Dave Morgan". The signature is written in a cursive style.

Dave Morgan
Global Product Manager, Hydrochloric Acid
Detrex Chemicals