



Use of Perchloroethylene In Isomerization Processes

For many years carbon tetrachloride has been used in the isomerization process in the Petroleum Refining industry. Since the Clean Air Act of 1990, where carbon tetrachloride was designated as an ozone depleting chemical, alternative products have been considered to replace carbon tetrachloride.

In the isomerization process, chlorinated solvents are used as chloriding agents providing a source of Chloride Ion (Cl⁻) which acts as a catalyst promoter. Chlorinated solvents are also used as a source of chloride for reforming catalysts. The chloriding agent may be used in the reforming process as an activator during normal operation and during regeneration.

As illustrated by the table below, perchloroethylene is especially suited for use as a chloriding agent due to the amount of Cl⁻ it can provide. Relative feed rates may be determined from the amount of available chloride, but you should always consult with your process licensor prior to initiating any changes.

Property	Carbon Tetrachloride	Perchloroethylene	Trichloroethylene	1,1,1 Tri-chloroethane
Formula	CCl ₄	C ₂ Cl ₄	C ₂ HCl ₃	C ₂ H ₃ Cl ₃
Wt% Cl ⁻	92.20	85.50	80.90	79.70
lb Cl ⁻ per gal	13.20	11.50	9.90	8.70

The general requirements for chlorinated solvents in isomerization and regeneration applications are for a high purity product with a minimum amount of oxygen and nitrogen compounds. OxyChem's Perchloroethylene, Isomerization Grade, meets these requirements.

Many isomerization processes have been licensed by UOP, a leader in the catalyst industry and a leader in the search for alternative chloriding agents. UOP has approved certain grades of perchloroethylene as an acceptable alternative to carbon tetrachloride in their isomerization process. Furthermore, OxyChem's Perchloroethylene, Isomerization Grade, has been approved as meeting UOP's stringent specifications. If you have any questions regarding the specific requirements, please consult with your licensor.

OxyChem's Perchloroethylene, Isomerization Grade, has a minimum of assay 99.995% (wt) perchloroethylene and contains only one stabilizer, p-tertiary amyl phenol (PTAP). This stabilizer is present at a maximum level of 15 ppm. The chemical formula for PTAP is C₁₁H₁₆O, which would contribute no more than 1.5 ppm oxygen to the product. The specification for water is a maximum of 25 ppm. This grade of perchloroethylene does not contain any nitrogen compounds.

Perchloroethylene is not listed by the EPA as an ozone depleting substance and is not subject to regulatory phase-out.

For further information on OxyChem's chlorinated solvents, contact the Technical & Environmental Services group at (800) 733-1165.

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