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Epoxidized Soybean Oil

About

Epoxidized soybean oil (ESO) is a non-toxic clear to yellow liquid that is the result of the oxidation of soybean oil with hydrogen peroxide and either acetic or formic acid. ESO is industrially available in large volume at a low price.

ESO is an epoxidized glycerol fatty ester that is used as a plasticizer and stabilizer in plastic materials. The substance is especially useful in PVC and its copolymers to keep plastics and rubber soft and pliable. The epoxy functionality provides excellent heat and light stability.

The term "epoxide" indicates three-membered cyclic ether in which an oxygen atom is jointed to each of two carbon atoms that are already bonded to each other. The unhindered oxygen atom carries two unshared pairs of electrons, a structure that favors the formation of coordination complexes and the solvation of cations. Because of equilateral triangle strain in this small ring, epoxides are more reactive than larger ring ethers.

Epoxides undergo reactions such as C—O bond cleavage, nucleophilic addition, hydrolysis and reduction under mild conditions and more rapidly than other ethers. Epoxides are formed by some oxidation reactions of alkenes with peracids.