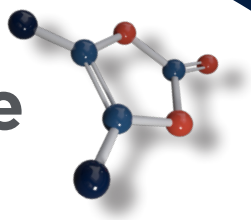
Gas Factsheet

Vinylene carbonate



Formula: $C_3H_2O_3$
CAS: 872-36-6
Source: Manufacturing of batteries, electronics and optical equipment
Detection Method: Tiger, Tiger^{LT}, Cub, Falco, TVOC 2, GasClam 2 & GasCheck G

Vinylene carbonate (VC) or 1,3-dioxol-2-one, is the simplest unsaturated cyclic carbonic acid ester. Vinylene carbonate can also be thought of as the cyclic carbonate of the hypothetical (Z)-ethene-1,2-diol. The activated double bond in this five-membered oxygen-containing heterocycle makes the molecule a reactive monomer for homopolymerization and copolymerization and a dienophile in Diels-Alder reactions. Below room temperature vinylene carbonate is a colourless stable solid.

$C_3H_2O_3$ - ADDITIVE TO ELECTROLYTE SOLUTIONS FOR LI-ION BATTERIES.

What Is Vinylene Carbonate

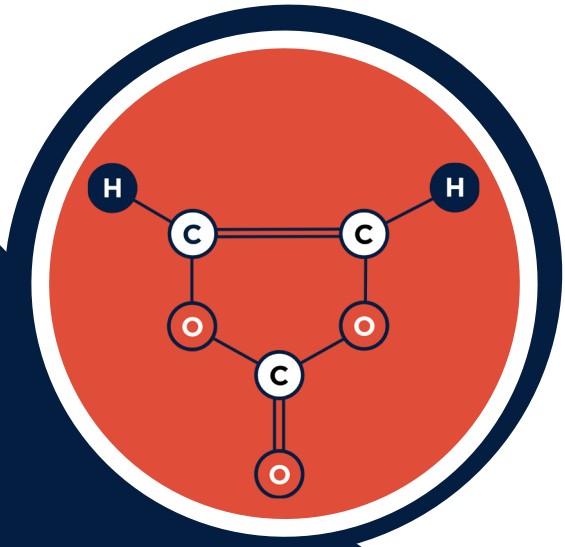
Vinylene carbonate is used widely as an electrolyte additive for lithium-ion batteries where it promotes the formation of an insoluble film between the electrolyte and the negative electrode: the SEI (solid-electrolyte-interface). This polymer film allows ionic conduction, but prevents the reduction of the electrolyte at the negative (graphite) electrode and contributes significantly to the long-term stability of lithium-ion batteries. A 2013 publication suggests that the cyclic sultone 3-fluoro-1,3-propanesultone (FPS) is superior to vinylene carbonate in SEI formation.

Properties Of Vinylene Carbonate

Industrially produced vinylene carbonate is usually a yellow to brown liquid. By suitable process control and purification steps, a solid product with a melting point of 20-22 °C and a chlorine content below 10ppm can be obtained. Liquid vinylene carbonate turns rapidly yellow even in the absence of light and must be stabilized by the addition of radical scavengers. In solid form, the highly pure substance is long-term stable when stored below 10 °C. Vinylene carbonate dissolves in a variety of solvents such as ethanol, tetrahydrofuran, ethylene carbonate, propylene carbonate, and other dipolar aprotic electrolyte solvents used for lithium ion rechargeable batteries such as dimethyl carbonate, diethyl carbonate and the like.

Exposure & Symptoms From VC

Breathing difficulties. May cause allergic skin reaction. Causes eye burns. Causes severe eye damage. Symptoms of overexposure may be headache, dizziness, tiredness, nausea and vomiting: Symptoms of allergic reaction may include rash, itching, swelling, trouble breathing, tingling of the hands and feet, dizziness, light headedness, chest pain, muscle pain or flushing



Vinylene carbonate Detection Instruments

Fixed Instruments


Semi-Portable Instruments


Portable Instruments


Personal Instruments

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