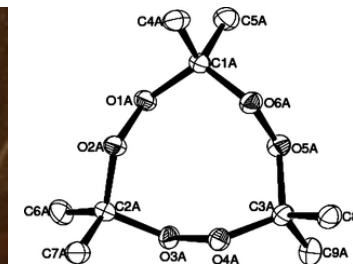


Near accident

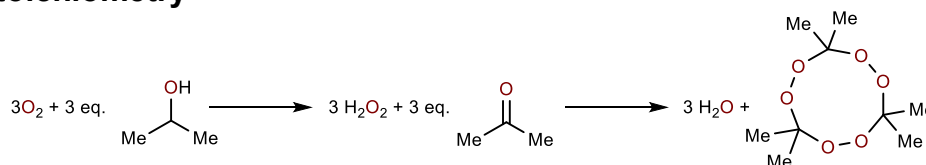
- 500 mL Life™ isopropanol bottle
- Storage: underneath a bathroom sink (in the dark)
- Expiration date: February 2007
- August 2017: isopropanol was used to sterilize an area of skin (scab formation)
- May 2019: isopropanol was used to sterilize an area of skin (scab formation)
- “Rationale”: sensitivity to isopropanol
- Some time after May 2019: bottle tipped over, plastic top cracked, contents partially spilled
- Contents were slower to volatilize than usual
- Content odor was off
- November 2019: A part of the contents were poured into the sink
- Gas evolution was observed
- ~25 g of solid white mass formed in the bottle
- The solid white mass was determined to be **triacetone triperoxide (TATP)** by X-ray analysis
- November 21st, 2019: Regional police carried out a controlled detonation of the bottle



Lesson

Isopropanol is a peroxide forming chemical!

Stoichiometry



Common Peroxide Forming Chemicals*			
<i>These lists are not all-inclusive. See also U Minnesota list of peroxide-forming chemicals with CAS and structures. Any UNOPENED bottles of peroxide-formers should be submitted as waste within 18 months of receipt or by the expiration date noted on the container, whichever comes first.</i>			
Class A	Chemicals that form explosive levels of peroxides without concentration	Store under inert gas if possible. Submit as waste or evaluate for peroxides within 3 months of opening.	
	Butadiene (inhibited liquid monomer)	Chloroprene (Chloroprene) – inhibited liquid monomer	Divinyl acetylene Potassium Amide Amide (sodamide) Vinylidene Chloride
Class B	Chemicals that form peroxides with concentration	Store under inert gas if possible. Submit as waste or evaluate for peroxides within 6 - 12 months of opening.	
	Acetal Acetaldehyde Benzyl Alcohol 2-Butanol Cumene Cyclohexanol 2-Cyclohexenone Cyclohexene	1-Phenylethanol 2-Phenylethanol 2-Propanol (isopropanol, IPA) Tetrahydrofuran Tetrahydronaphthalene Vinyl Ethers Other secondary alcohols	
Class C	Chemicals that form peroxides with concentration	Without inhibitor: Submit as waste or evaluate for peroxides within 12 months of opening. With inhibitor: Do not submit as waste (required for inhibitors to work). Submit as waste or evaluate for peroxides within 12 months of opening.	
	Acrylic Acid Acrylonitrile Butadiene Chloroprene	Tetrafluoroethylene Vinyl Acetate Vinyl Chloride	Vinyl Pyridine Vinylidene chloride

Pye C. C. *ACS Chem. Health Saf.* **2020**, 27, 279. <https://doi.org/10.1021/acs.chas.0c00061>

See also: Peter Ryffel: Peroxide Forming Chemicals! Safety of the week. https://www.sarlahgroup.com/files/ugd/207b1c_b3c8fdebabd34510b45d7c43a612922d.pdf

Peter Ryffel