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Saran Resin — Its Properties and Uses

by Ken Kosanke

Saran™ resin in its most common form is Saran Wrap,™ the original plastic food wrap manufactured by Dow Chemical. Technically, Saran resin is polyvinylidene chloride, which has the chemical formula of:

$[\text{-}CH_2 \cdot CHCl_2\text{-}]_n$.

Polyvinyl chloride (PVC), has the empirical formula of:

$[\text{-}CH_2 \cdot CHCl\text{—}]_n$.*

Thus Saran resin is essentially PVC with a second chlorine atom per formula unit. Where PVC is only 57% chlorine, Saran resin is 73% chlorine. (Note that Parlon,™ which is 68% chlorine, also falls short of Saran resin.)

Saran resin is highly resistant to attack by chemicals and solvents as it is quite inert at temperatures below about 150 °C(≈300 °F.)

Saran resin, Parlon and PVC are all chlorinated hydrocarbons, and are used in pyrotechnics as so-called chlorine donors or color enhancers. The mechanism of chlorine color enhancement is beyond the scope of this short article, but is discussed at length in the author's "Physics, Chemistry and Perception of Colored Light (Part 2)," which appeared in *Pyrotechnica IX,* 1984.

Besides acting as a source of chlorine in a colored flame, chlorinated hydrocarbons also function as a fuel. However, all fuels are not equal in their burn characteristics. Thus a brief study was undertaken using Saran resin, with potassium perchlorate as the oxidizer. With properly adjusted formulations, Saran resin was found to equal or surpass PVC and Parlon with respect to ease of ignition, size of flame envelope, and resistance to being extinguished (blown blind).

* Note that this may be a copolymer made with up to 20% of other unsaturated compounds.