

# ULTRAPURE™ CARBONATES

**HUNTSMAN**

Enriching lives through innovation

Huntsman is the only North American producer of alkylene carbonates, including **ULTRAPURE™ Ethylene Carbonate (EC)** and **ULTRAPURE™ Propylene Carbonate (PC)**. Huntsman offers a range of high purity **ULTRAPURE™** aprotic solvents for lithium-ion and sodium batteries, supercapacitors, dynamic glazing, and polymer photoresist removal in microelectronics.

## PRODUCT OVERVIEW

Impurities can reduce battery performance and lifetime, and high-purity carbonates play a critical role as solvents for electrolytes in lithium-ion batteries. **ULTRAPURE™ Ethylene** and **Propylene Carbonate** offer low water, glycol, trace metals, and anions that are strictly controlled from production to delivery to promote optimal operation.

**ULTRAPURE™ Carbonates** are offered in three different grades with the highest purity, **ULTRAPURE™ EV**, formulated to improve battery working life and provide reliable operation.



## BENEFITS

- >99.9% purity
- Low water
- Industry proven
- Low VOC
- Electrolyte solvent for lithium-ion and sodium batteries
- Electro and photochromatic dynamic glazing
- Semiconductor formulated cleans and polymer removal
- Solvent for pharmaceuticals and cosmetics

## PRODUCT GUIDE

Ethylene Carbonate	Color	Purity	Water	Glycols	Anions	Cation
ULTRAPURE™ EV	+++	+++	+++	+++	+++	+++
ULTRAPURE™ HP	++	++	++	++	N/A	N/A
ULTRAPURE™ BG	++	+	+	+	N/A	N/A

Propylene Carbonate					Halides	UV Absorbance
ULTRAPURE™ EV	+++	+++	+++	+++	+++	+++
ULTRAPURE™ HP	++	++	++	++	N/A	++
ULTRAPURE™ BG	+	+	+	+	N/A	+

**KEY**    +++ : Best Quality    ++ : High Quality    + : Good Quality

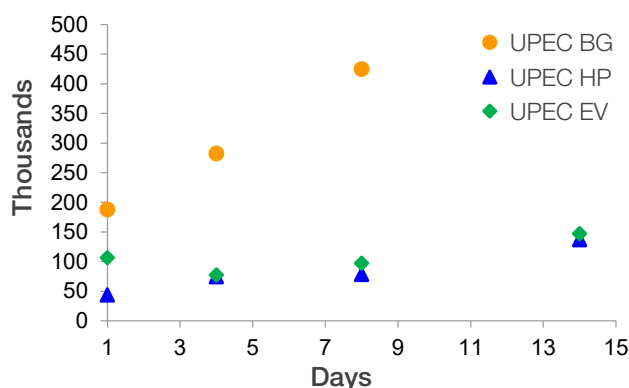
### TYPICAL PROPERTIES

	Ethylene Carbonate	Propylene Carbonate
Viscosity (cP)	1.50 (20°C)	2.47 (25°C)
Flash Point (°C, cc)	152	135
Boiling Point (°C)	248	242
Melting Point (°C)	36	-49
Dipole Moment	4.90	4.98
Dielectric Constant	89 (40°C)	64.9 (20°C)
Solubility Parameter		
dD	18.0	20.0
dP	21.7	18.0
dH	5.1	4.1

**ULTRAPURE™ EC** and **ULTRAPURE™ PC** offer a combination of good solubility of Li salts, high voltage stability, and maintain a stable dielectric constant during extended cycle life, making these products excellent for demanding electrolyte applications.

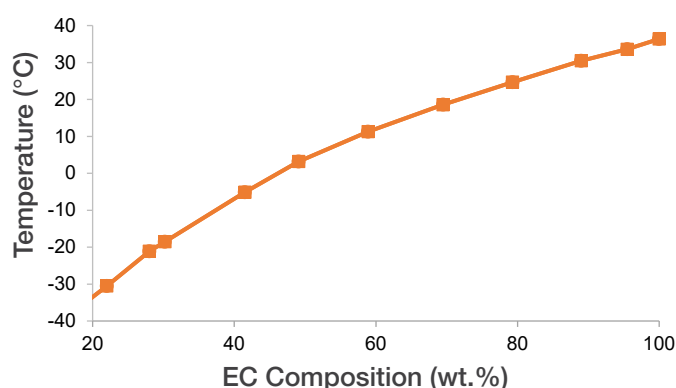
### PERFORMANCE DATA

#### Color Stability of 1 Molar LiPF<sub>6</sub> at 290nm



In 1M LiPF<sub>6</sub> in **ULTRAPURE™ EC:EMC (1:2 v/v)**, **ULTRAPURE™ EC EV** and **ULTRAPURE™ EC HP** demonstrated the best color stability and performance.

#### Melting Curve for EC/PC Blends



The freezing point of **ULTRAPURE™ EC** can be depressed by blending with **ULTRAPURE™ PC**, which improves product handling. The melting curve above illustrates the melting point changes in **ULTRAPURE™ EC/PC** based on the composition of the blend.

For more information, contact your local Huntsman representative. [www.huntsman.com](http://www.huntsman.com) / [AdTech@huntsman.com](mailto:AdTech@huntsman.com)

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