

Product Information

Poly(thiophene-3-[2-(2-methoxyethoxy)ethoxy]-2,5-diyl), sulfonated solutions

Catalog Numbers **699799** and **699780**

Store at Room Temperature

Technical Bulletin AL-251

TECHNICAL BULLETIN

CAS RN 1003582-37-3

Synonyms: Plexcore® OC 1100 and OC 1200

Product Description

Poly(thiophene-3-[2-(2-methoxyethoxy)ethoxy]-2,5-diyl), sulfonated solutions are organic conductive inks designed for spin coating applications. However, they have also been evaluated and may be used in conjunction with other film deposition techniques such as ink jet printing, slot-die, and gravure.

The inks are typically used as a hole injection layer (HIL) in organic light emitting diode (OLED) devices for lighting and display applications, and as the hole transport layer (HTL) in organic photovoltaic (OPV) devices. In addition, these inks can be used in other devices, for example organic photo-detectors, smart labels, and field effect transistors.

Two different solutions are offered (Catalog Numbers 699799 and 699780) with the following properties:

Property	Catalog Number 699799	Catalog Number 699780
Synonym	Plexcore OC 1100	Plexcore OC 1200
Solvent	2% in 1,2-propanediol/ isopropanol	2% in ethylene glycol monobutyl ether/water (3:2)
Resistivity	50–500 Ω·cm	500–2,000 Ω·cm
Viscosity	8–15 cP (Brookfield)	5–12 cP (Brookfield)
Assay	≥99.99% (trace metal basis)	
Work Function	5.1–5.2 eV	
pH	2.2–2.4	
Density	0.95 g/mL (25 °C)	
Surface Tension	35–38 dynes/cm	

Hole injection is the phenomenon of a positive charge (hole) being transferred from an electrode into a semiconducting layer within a device. The inks enable hole injection between the electrode and the neighboring semiconducting layer by reducing the energy barriers between the electrode and the semiconducting layer.

Improved hole injection implies the capability to modulate it depending on the requirement for charge balance within the device. This impacts OLED performance by improving the lifetime of the device. In addition, the effective reduction of energetic barriers at interfaces enables lower operating voltage of the OLED.

The sulfonated polythiophene inks have lower acidity compared to conventional hole injection layer (HIL) materials and form dried film which are less hygroscopic than conventional HIL materials.

Figure 1.
Plexcore OC 1100 – Optical Transmission
(100 nm film thickness)

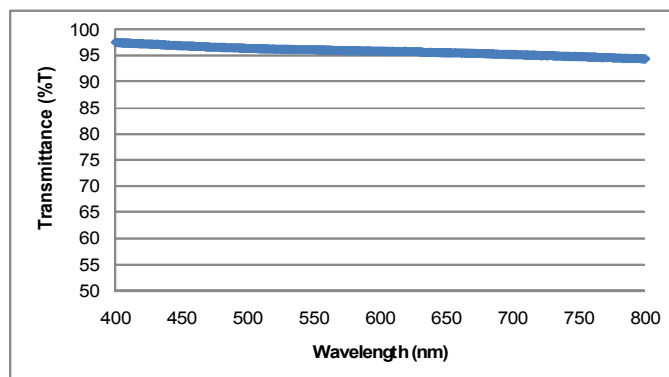
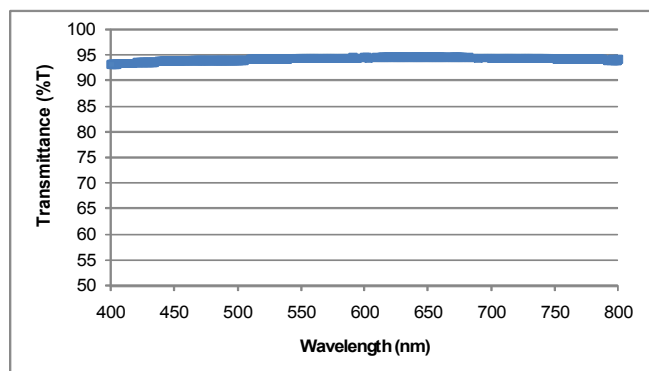


Figure 2.
Plexcore OC 1200 – Optical Transmission
(100 nm film thickness)



Precautions and Disclaimer

This product is for R&D use only, not for drug, household, or other uses. Please consult the Material Safety Data Sheet for information regarding hazards and safe handling practices.

Storage/Stability

Store the solutions at room temperature in a sealed container protected from light.

When stored under appropriate conditions, these solutions should maintain their performance for at least 6 months. Changes in viscosity and film resistivity may be experienced beyond this time period.

In OLED and OPV applications, performance of these solutions is not significantly affected by processing in either air or inert atmosphere (i.e., glovebox). Other layers of the device may require inert atmosphere or vacuum environments, which do not typically impact the performance of the solutions. These solutions tolerate typical solvents used in spin casting (i.e., toluene, xylene, dichlorobenzene).

Procedure

The solutions have been filtered prior to shipment. However, they may be filtered, if so desired, before application using a PVDF membrane (0.45 μm). Allow solutions to come to room temperature prior to application.

In typical spin coating applications, 1–2 ml of solution can be expected to be used for glass substrates that are 2 inches by 2 inches.

Figure 3.
Plexcore OC 1100 – Spin Curve

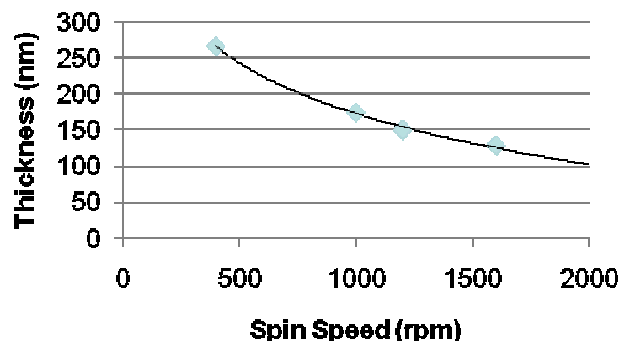
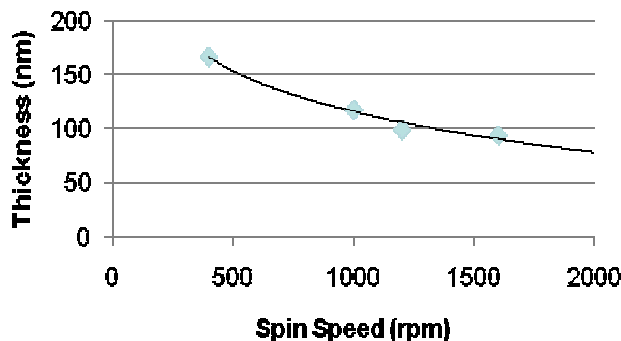


Figure 4.
Plexcore OC 1200 – Spin Curve



Drying Conditions are 140–170 °C on a hot plate for 15–30 minutes in air or inert atmosphere.

Plexcore is a registered trademark of Plextronics, Inc. Product of Plextronics, Inc. U.S. Patent 6,166,172.

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