



## pSOL

### Ionomer electrode binder

Ionomer Binder Properties	
Material description	Phosphonic acid ionomer - Poly(tetrafluorostyrene phosphonic acid-co-pentafluorostyrene)  10 mL of 5 wt% in ethanol, amber vial with Teflon liner cap
Thin film ionic conductivity after activation with a small amount of phosphoric acid	> 10 mS cm <sup>-1</sup> at 100 °C and above
Thermal stability of the ionomer material (measured by TGA)	Up to 250 °C

U.S. Provisional Patent Application 63/19,2607; International Patent Application 221205-2240

Peer-review literature reports documenting pSOL data:

Venugopalan, G.; Chang, K.; Nijoka, J.; Livingston, S.; Geise, G. M.; Arges, C. G. Stable and Highly Conductive Polycation-Polybenzimidazole Membrane Blends for Intermediate Temperature Polymer Electrolyte Membrane Fuel Cells. *ACS Applied Energy Materials* **2020**, 3 (1), 573-585.

Chaichi, A.; Venugopalan, G.; Devireddy, R.; Arges, C.; Gartia, M. R. A Solid-State and Flexible Supercapacitor That Operates across a Wide Temperature Range. *ACS Applied Energy Materials* **2020**, 3 (6), 5693-5704.

Venugopalan, G.; Bhattacharya, D.; Kole, S.; Ysidron, C.; Angelopoulou, P. P.; Sakellariou, G.; Arges, C. G. Correlating high temperature thin film ionomer electrode binder properties to hydrogen pump polarization. *Materials Advances* **2021**, 2 (13), 4228-4234.

Venugopalan, G.; Bhattacharya, D.; Andrews, E.; Briceno-Mena, L.; Romagnoli, J.; Flake, J.; Arges, C. G. Electrochemical Pumping for Challenging Hydrogen Separations. *ACS Energy Letters* **2022**, 7 (4), 1322-1329.