

Aemion⁺™

Breakthrough Alkaline Stability in Anion Exchange Materials

Features & Benefits

- **High performance** – high current density and voltages generated to maximize power density and efficiency
- **Total chemical stability** – half life of >5000 h in 10 M KOH at 100 °C
- High **ion conductivity** and **selectivity**
- Ease of handling – **Processable** in common solvents for optimized electrochemical properties and catalyst layers

Typical Applications

- AEM Fuel Cells
- AEM / Alkaline Electrolyzers
- Metal-Air Batteries
- CO₂ Electrolysis
- Acid Recovery & Metal Separation

Ionmr's advanced anion exchange membranes and polymers are a breakthrough in material science with a unique hydrocarbon structure and the strongest alkaline stability available, making it the only product of its kind. **Aemion⁺™** provides specialized solutions to OEMs with unique application challenges.

Aemion⁺™ can be utilized in the harshest of conditions, enabling completely new applications and providing massive efficiency and performance gains for existing solutions.

MATERIAL PROPERTIES

Ion Transport Options	HCO ₃ ⁻ , CO ₃ ²⁻ , OH ⁻
Conductivity¹ (OH⁻/CO₃²⁻)	14 - 16 mS/cm @ 24° C
Tensile Strength	> 25 MPa
Young's Modulus	> 150 MPa
Elongation	> 25%
Max Temp	105 °C
Chemical Stability	10M KOH at 100° C
Calculated Half-life²	> 5000 Hours

¹ Measured in OH⁻/CO₃²⁻ form after exchange in KOH, by in-plane EIS in air at RT

² 0% degradation over 168 hours by NMR

All data should be used as a guide only, not a specification and is subject to change

PRODUCT REFERENCE DATA

Product Code	Thickness µm	Reinforce- ment	IEC meq/g	Resistance (OH ⁻) mΩ.cm ²	H ₂ Crossover ³ mA/cm ²	Slope mA/cm ² ·kPa	Dim Swelling / H ₂ O Uptake %
AF2-HWP7-75-X*	75	Polyolefin	1.4-1.7	< 150	< 1	< 0.005	< 1 / 35
AP2-HNN7-00-X*	-	-	1.6-1.9	-	-	-	- / 35

³ Tested at 60 °C, 100% RH, 150 kPag

*Items herein are prototype materials only intended to be used for early development activities and not intended for production items. Ionmr has used best practices in the materials and will work with the customer to continue to develop the items into production solutions over the next 12 to 18 months.

Company

Ionmr Innovations was founded in 2017 to pursue our passion to advance clean technology and the circular economy. In order to address limiting, ongoing performance and lifetime shortcomings within the industry, we are commercializing a line of revolutionary ion-exchange materials that remedy these issues and bring the first non-fluorinated, environmental alternative to market.

At Ionmr, we bring the best of Canadian research in chemistry and engineering to market, to bridge the gap between materials science and real-world industrial problems. The Ionmr team was thoughtfully selected to develop materials that solve unique application challenges, and will leave a lasting impact on the global hydrogen, energy storage and sustainable chemical economies. We provide value to our customers through our core competencies, which drive our materials development and establish our place as a global solutions provider.

Experienced — The Ionmr team has detailed knowledge of electrochemical systems and other applications, and can work with your team to enhance your products.

Trustworthy — As a team with a long history of producing membranes, Ionmr offers assurance that your product will achieve consistent high performance as you engage your marketplace.

Aemion⁺™ Membrane & Ionomer

Aemion⁺™ is the new anion exchange product currently in late stages of development at Ionmr. Aemion⁺™ represents fundamental shift in the approach to anion exchange technology. The exceptional alkaline stability of Aemion⁺™ paired with its high performance, unlocks many end use applications that were previously constraint by the membrane's integrity.

Notably, Aemion⁺™ provides a platform for that enables various clean-tech applications that are significant for decarbonizing the energy grid including cost-effective green hydrogen production through AEM electrolysis, AEM fuel cells and metal air batteries.

Some of the many benefits include:



Processable — Aemion⁺™ can be used in dry membrane form and is soluble in low-boiling solvents as an ionomer, allowing simple, consistent integration into existing products as a high strength industrial coating.

High Performance — Aemion⁺™ provides record setting conductivities to enable higher current densities and higher efficiencies than ever before.

Stable — Aemion⁺™ is chemically and oxidatively stable across the full spectrum of operating conditions showing essentially 0 degradation when subjected to radical attack at high temperatures.

High Strength — The functional backbone of our material eliminates the breakdown sites, resulting in the highest possible chemical and physical strength.