Thermophysical Properties of Polystyrene Sulfonic Acid at Room Temperature

# 1. Density

The density of Polystyrene Sulfonic Acid (PSSA) typically ranges from 1.25 to 1.30 g/cm³.

Reference: Ismail, A.F., Zubir, N., Nasef, M.M., Dahlan, K.M., Hassan, A.R. (2005). Physico-chemical study of sulfonated polystyrene pore-filled electrolyte membranes by electrons induced grafting. Journal of Membrane Science, 254(1–2), 189–196. DOI: 10.1016/j.memsci.2005.01.006.

# 2. Glass Transition Temperature (Tg)

The glass transition temperature (Tg) of PSSA typically ranges from 150°C to 180°C.

References:

1. Acar, O., Sen, U., Bozkurt, A., Ata, A. (2010). Blend membranes from poly(2,5-benzimidazole) and poly(styrene sulfonic acid) as proton-conducting polymer electrolytes for fuel cells. Journal of Materials Science, 45(4), 993–998. DOI: 10.1007/s10853-009-4030-6.

2. Arunbabu, D., Sanga, Z., Seenimeera, K.M., Jana, T. (2009). Emulsion copolymerization of styrene and sodium styrene sulfonate: kinetics, monomer reactivity ratios and copolymer properties. Polymer International, 58(1), 88–96. DOI: 10.1002/pi.2497.

# 3. Thermal Conductivity

The thermal conductivity of PSSA is approximately 0.12 W/m·K.

References:

1. Material-Properties.org. URL: https://material-properties.org/polystyrene-density-strength-hardness.

2. Safronova, L. P., & Lebedev, M. V. (1980). Polymer Science USSR, 22(2), 454-457.

# 4. Specific Heat Capacity (Cp)

The specific heat capacity of PSSA is around 1100 J/kg·K at room temperature.

References:

1. Material-Properties.org. URL: https://material-properties.org/polystyrene-density-strength-hardness.

2. Shang, X., Tian, S., Kong, L., Meng, Y. (2005). Synthesis and characterization of sulfonated fluorene-containing poly(arylene ether ketone) for proton exchange membrane. Journal of Membrane Science, 266(1–2), 94–101. DOI: 10.1016/j.memsci.2005.05.014.