### LIST OF ABBREVIATIONS

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>AR</td>
<td>Analytical reagent</td>
</tr>
<tr>
<td>C1, C2</td>
<td>Concentrations of electrolyte solution on either side of the membrane (mol/L)</td>
</tr>
<tr>
<td>$\overline{C}_{i+}$</td>
<td>Cation concentration in membrane phase 1 (mol/L)</td>
</tr>
<tr>
<td>$\overline{C}_{2+}$</td>
<td>Cation concentration in membrane phase 2 (mol/L)</td>
</tr>
<tr>
<td>$C_i$</td>
<td>$i^{th}$ ion concentration of external solution (mol/L)</td>
</tr>
<tr>
<td>$\overline{C}_i$</td>
<td>$i^{th}$ ion concentration in membrane phase (mol/L)</td>
</tr>
<tr>
<td>$\overline{D}$</td>
<td>Charge density in membrane (eq/L)</td>
</tr>
<tr>
<td>F</td>
<td>Faraday constant (C/mol)</td>
</tr>
<tr>
<td>100–160</td>
<td>Pressure (MPa)</td>
</tr>
<tr>
<td>q</td>
<td>Charge effectiveness of the membrane</td>
</tr>
<tr>
<td>R</td>
<td>Gas constant (J/K/mol)</td>
</tr>
<tr>
<td>SCE</td>
<td>Saturated calomel electrode</td>
</tr>
<tr>
<td>SEM</td>
<td>Scanning electron microscopy</td>
</tr>
<tr>
<td>TMS</td>
<td>Teorell, Meyer and Sievers</td>
</tr>
<tr>
<td>t+</td>
<td>Transport number of cation</td>
</tr>
<tr>
<td>t-</td>
<td>Transport number of anion</td>
</tr>
<tr>
<td>$\overline{\mu}$</td>
<td>Mobility of cations in the membrane phase (m2/v/s)</td>
</tr>
<tr>
<td>$\overline{\nu}$</td>
<td>Mobility of anions in the membrane phase (m2/v/s)</td>
</tr>
<tr>
<td>Vk</td>
<td>Valency of cation</td>
</tr>
<tr>
<td>Vx</td>
<td>Valency of fixed-charge group</td>
</tr>
<tr>
<td>$\overline{\Upsilon}$</td>
<td>$\overline{\Upsilon} = (\overline{\mu} - \overline{\nu}) / (\overline{\mu} + \overline{\nu})$</td>
</tr>
<tr>
<td>$\gamma_z$</td>
<td>Mean ionic activity coefficients</td>
</tr>
<tr>
<td>$\omega$</td>
<td>Mobility ratio</td>
</tr>
<tr>
<td>$\Delta\psi_m$</td>
<td>Observed membrane potential (mV)</td>
</tr>
<tr>
<td>$\Delta\overline{\Upsilon}_m$</td>
<td>Theoretical membrane potential (mV)</td>
</tr>
<tr>
<td>$\Delta\psi_{Don}$</td>
<td>Donnan potential (mV)</td>
</tr>
<tr>
<td>$\Delta\overline{\Upsilon}_{diff}$</td>
<td>Diffusion potential (mV)</td>
</tr>
<tr>
<td>MCP</td>
<td>Magnesium Calcium Phosphate</td>
</tr>
<tr>
<td>MSP</td>
<td>Magnesium Strontium Phosphate</td>
</tr>
</tbody>
</table>