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(54) Title: SOLID GEL MEMBRANE (57) Abstract A highly conductive polymer based solid gel membrane is disclosed. The membrane is especially well-suited for use in such electrochemical devices as metal/air, Zn/MnO₂, Ni/Cd and hydrogen fuel cells, as well as in electrochromic devices such as smart windows and flat panel displays. Furthermore, in rechargeable electrochemical cells, the solid gel membrane is highly effective for use as a separator between the anode and charging electrode. In accordance with the principles of the invention, the highly conductive membrane comprises a support or substrate and a polymeric gel composition having an ionic species contained in a solution phase thereof. The polymer-based gel is prepared by adding an ionic species to a monomer solution followed by polymerization. After polymerization, the ionic species is embedded in the polymer-based gel where it remains. The ionic species behaves like a liquid electrolyte, while at the same time, the polymer-based solid gel membrane provides a smooth impenetrable surface that allows for the exchange of ions. An advantage of the novel membrane is that its measured ionic conductivity is much higher than previously observed in prior art solid electrolytes or electrolyte-polymer films.		

