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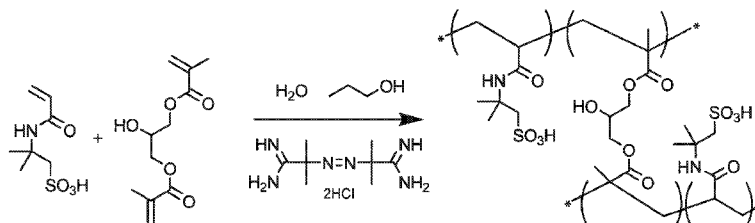


FIG. 1

(57) **Abstract:** The application describes a method of preparing a polymer that includes: mixing in an aqueous solution comprising water and a water-soluble alcohol: a vinyl-based monomer having a sulfonic acid functional group, a bifunctional vinyl-based cross-linking agent, and a polymerization initiator, to form a reaction solution, where the monomer and the cross-linking agent are soluble in the reaction solution; and polymerizing the monomer and cross-linking agent to form the polymer. The application further describes a polymer that includes a polymer backbone comprising sulfonic acid functional groups; and crosslinks comprising alcohol functional groups.