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(54) **POLYMERIC ACID CATALYSIS**

(71) Applicants: **Ning Shangguan**, Cherry Hill, NJ (US); **Andrew Feiring**, Wilmington, DE (US); **Ashokkumar B. Shenvi**, Wilmington, DE (US)

(72) Inventors: **Ning Shangguan**, Cherry Hill, NJ (US); **Andrew Feiring**, Wilmington, DE (US); **Ashokkumar B. Shenvi**, Wilmington, DE (US)

(73) Assignee: **Compact Membrane Systems, Inc.**, Newport, DE (US)

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See application file for complete search history.

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Primary Examiner — Nizal Chandrakumar
(74) *Attorney, Agent, or Firm* — Jeffrey C. Lew

(57) **ABSTRACT**

A highly fluorinated polymer is very useful as an acid catalyst. The highly fluorinated polymer has at least two repeating unit types that are the polymerized derivatives of a perfluorinated cyclic or cyclizable compound and a highly fluorinated vinyl ether compound having a sulfur containing functional group. The polymer can be formed by radical copolymerization of the fluorinated monomers with the sulfur-containing functional group in sulfonyl fluoride form (—SO_2F) that is subsequently converted to sulfonic acid form (—SO_3H). The highly fluorinated polymer can be used to advantage in a solution comprising an aprotic, polar organic solvent that has a dielectric constant of at least 15 and preferably is free of hydroxyl functional groups. Suitable solvents are those in which the polymer is soluble to at least 1 wt %. Hydroxyl group-containing protic, polar organic solvents are less preferred. The highly fluorinated polymer can be an effective heterogeneous catalysts when used in form of solid, fine particles insolubly suspended in or in contact with a fluid reaction mass.

15 Claims, No Drawings