WHAT IS CLAIMED IS:

1. A process for preparing a membrane, comprising:

(a) applying a fluid composition of sulfonated block copolymer, ester of residual carboxylic acid and non-halogenated aliphatic solvents onto the surface of a substrate ~~and optionally other process aids~~, said fluid composition prepared by the steps of:

i. providing a precursor block copolymer having at least two end blocks A and at least one interior block B, wherein each A block is a polymer block resistant to sulfonation and each B block is a polymer block susceptible to sulfonation;

ii. reacting the precursor block polymer with a C2 to C8 acyl sulfate in a reaction mixture further comprising at least one non-halogenated aliphatic solvent to form a sulfonated block polymer, therein resulting in the formation of a solution of a sulfonated block copolymer and a residual carboxylic acid; and

iii. subsequently reacting the residual carboxylic acid contacted with a C1 to C4 alcohol or mixture thereof in a molar ratio of alcohol to residual carboxylic acid of at least 0.9:1 to form the corresponding alkyl esters of the carboxylic acid and to reduce the residual level of the organic residual acid to less than 2.0 wt % based on the total weight of the solution, wherein the reaction mixture is free of any halogenated solvent,

(b) spreading the fluid composition to form a uniform thickness layer on the substrate, and

(c) allowing the solvent to evaporate from the fluid composition resulting in a solid membrane.

2. The process of claim 1 wherein step (b) includes spreading the fluid composition through a die or reverse roll coater.

3. The process of claim 2 wherein the thickness of the resulting layer is between 0.1 microns and 1 mm.

4. The process of claim 1 wherein said fluid composition is spread on a porous substrate.

5. The process of claim 4 wherein said porous substrate is selected from the group consisting of microporous membranes, expanded poly(tetrafluoro)ethylene and fibrous mats.

6. The process of claim 1 wherein step (c) includes heating the fluid composition.

7. The process of claim 1 wherein said fluid composition is spread onto the surface of a substrate in an atmosphere containing water vapor at a relative humidity greater than 10%.

8. A membrane formed by the process of claim 1.

9. The membrane of claim 8 having a tensile strength of at least 100 psi when wet.

10. The membrane of claim 8 exhibiting ion exchange capacity of between ~~about~~ 0.4 meq/g and ~~about~~ 2.5 meq/g.

11. The membrane of claim 8 wherein the membrane is in the shape of a flat sheet, a tube, or in the shape of a perform article.