CLAIMS

1. A method of preparing a membrane comprising the steps of:

(a) mixing together a membrane-forming polymer, a water-soluble polyetheramine being a polyether with at least one primary or secondary amine group attached to the polyether backbone, and a solvent, the mixture containing no component which will react chemically with the polyetheramine; and

(b) casting the mixture to form the polymer into a solid membrane.

2. A method according to Claim 1, in which the water solubility of the polyetheramine is at least 0.1% w/v at 21°C.

3. A method according to Claim 2, in which the water solubility of the polyetheramine is at least 0.2% w/v at 21°C.

4. A method according to Claim 3, in which the polyetheramine is miscible with water at 21°C.

5. A method according to any preceding claim, in which the polyetheramine has a molecular weight of up to 2,500.

6. A method according to Claim 5, in which the polyetheramine has a molecular weight of up to 1,000.

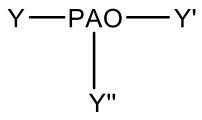
7. A method according to Claim 6, in which the polyetheramine has a molecular weight in the range of from 150 to 1,000.

8. A method according to any preceding claim, in which the polyetheramine contains two or more ethylene oxide and/or propylene oxide monomer units and at least one primary or secondary amine unit -NHX where X is a hydrogen atom or a C_{1-4}alkyl group.

9. A method according to any preceding claim, in which the polyetheramine is a mono- or di-amine having the schematic formula:

Y-PAO-Y' (I)

or a mono-, di- or tri-amine having the schematic formula:



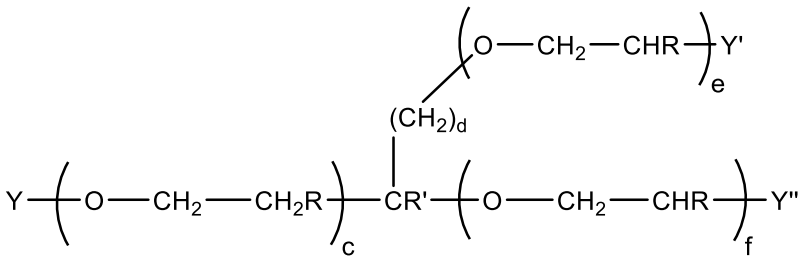
(II)

in which each of Y, Y' and Y" independently represents an end group at least one of which includes a primary or secondary amine group, and PAO represents a polyalkyleneoxide chain consisting of at least two ethylene oxide and/or propylene oxide monomer units.

10. A method according to Claim 9, in which the polyetheramine has the schematic formula:

$$Y\text{-}(O\text{-}CH_2\text{-}CH(CH_3))_a\text{-}(O\text{-}CH_2\text{-}CH_2)_b\text{-}Y' \qquad (III)$$

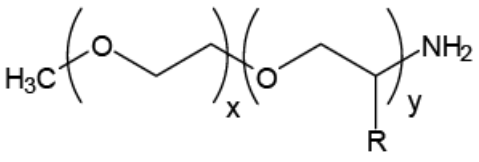
in which a represents the number of propylene oxide monomer units present and b represents the number of ethylene oxide monomer units present; or the general formula:



(IV)

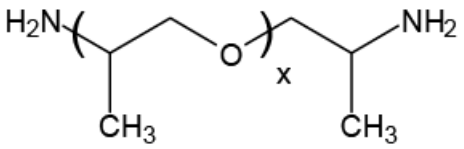
in which R represents a hydrogen atom or a methyl group, R' represents a hydrogen atom, a methyl or an ethyl group, d is 0 or 1, and c, e and f are the number of propylene oxide and/or ethylene oxide monomer units present.

11. A method according to any preceding claim, in which the polyetheramine has one of the formulae:



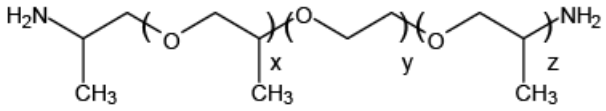
(V)

in which R is H or CH_3, and x and y are the numbers of propylene oxide and/or ethylene oxide monomer units in the polyether chain;



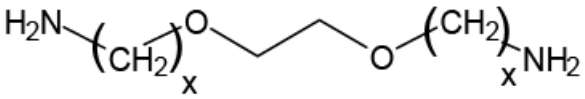
(VI)

in which x is the number of propylene oxide monomer units in the polyether chain;



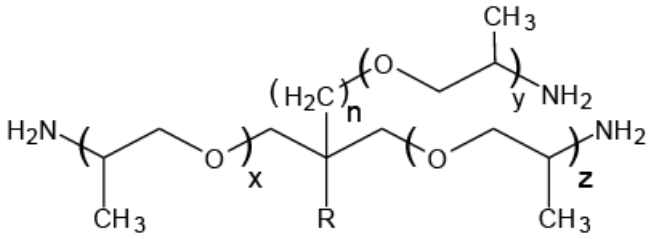
(VII)

in which x and z are the number of propylene oxide monomer units in two blocks in the polymer chain, and y is the number of EO monomer units in the polyether chain;



(VIII)

in which x is 2 or 3;



(IX)

in which x, y and z together represent the total number of propylene oxide monomer units present in the branched chain polymer, n is 0 or 1, and R is hydrogen, methyl or ethyl;

or a compound of one of the formulae (V) to (IX) above in which one or more of the NH_2 end groups has been converted into a secondary amine group.

12. A method according to Claim 11, in which the polyetheramine has the formula (IX), in which the number of moles of polyethylene oxide is between 5 and 6; or in which the polyetheramine has the formula (VI), in which x in the formula (VI) is on average from 6 to 7.

13. A method according to any preceding claim, in which the membrane-forming polymer is selected from cellulose acetate/triacetate; polyamide; polypiperazine; polybenzimidazoline; polysulfone; polyol; polyacrylonitrile; polyethersulfone; polysulfone; poly(phthalazinone

ether sulfone ketone; poly(vinyl butyral); polyvinylidene fluoride; poly(tetrafluoroethylene); polypropylene; polyethylene; and polyetheretherketone.

14. A method according to any preceding claim, in which the membrane-forming polymer is selected from polysulfone, polyethersulfone, polyvinylidene fluoride, polyacrylonitrile, or polyethylene.

15. A method according to any preceding claim, in which the solvent used in step (a) is or includes DMF, NMP, dimethylacetamide, acetone, DMSO, or THF.

16. A method according to any preceding claim, in which step (b) comprises immersing the mixture produced in step (a) in a medium in which the polymer is insoluble.

17. A method according to any preceding claim, in which the medium is an aqueous medium.

18. A method according to any preceding claim, in which the membrane obtained in step (b) is subsequently provided with a coating.

19. A membrane preparable by a process according to any preceding claim.

20. A membrane according to Claim 19, which is a nanofiltration membrane or a reverse osmosis membrane.