CLAIM(S):

1. A microporous polymeric membrane comprising

(a) a first surface, comprising a microporous surface,

(b) a second surface comprising a microporous surface; and

(c) a microporous bulk between the first surface and the second surface;

wherein the membrane has a machine direction and a cross machine direction, and the first surface has a plurality of parallel channels in the machine direction, wherein the channels have side walls and bottom walls, the side walls comprising rough surfaces, the rough surfaces having an Ra in the range of from about 4.5 μin to about 19.0 μin.

2. The membrane of claim 1, wherein the channels have side walls having rougher surfaces than the bottom walls.

3. The membrane of claim 1 or 2, wherein the side walls have rough surfaces having an Ra in the range of about 5 μin to about 9 μin.

4. The membrane of claim 1 or 2, wherein the side walls have rough surfaces having an Ra in the range of about 9.5 μin to about 16.0 μin.

5. The membrane of any one of claims 1-4, wherein at least about 35% of the first surface has the plurality of parallel channels in the machine direction.

6. The membrane of any one of claims 1-5, comprising a sulfone membrane.

7. The membrane of claim 6, comprising a polyethersulfone membrane.

8. The membrane of any one of claims 1-5, comprising a polyamide membrane, or a PVDF membrane.

9. A filter comprising at least one membrane according to any one of claims 1-8.

10. A filter comprising at least two membranes according to any one of claims 1-8.

11. A method of removing undesirable material from a fluid, the method comprising passing the fluid from a first surface of a microporous membrane through a second surface of the membrane, the first surface comprising a microporous surface, the second surface comprising a microporous surface; the membrane having a microporous bulk between the first surface and the second surface; wherein the membrane has a machine direction and a cross machine direction, and the first surface has a plurality of parallel channels in the machine direction, wherein the channels have side walls and bottom walls, the side walls comprising rough surfaces, the rough surfaces having an Ra in the range of from about 4.5 μin to about 19.0 μin.

12. The method of claim 11, comprising removing viruses from a protein containing fluid.

13. A method of removing undesirable material from a fluid, the method comprising passing the fluid through the filter of claim 9.

14. A method of removing undesirable material from a fluid, the method comprising passing the fluid through the filter of claim 10.

15. A method of preparing a membrane comprising:

obtaining a substrate comprising a surface having a machine direction and a cross machine direction and having parallel abrasions in the surface in the machine direction;

casting a polymeric solution on the surface;

effecting phase separation of the solution and forming a microporous membrane; and,

peeling the membrane from the substrate, wherein portions of the membrane contacting the parallel abrasions in the surface of the substrate are pulled away from the membrane, forming a membrane having a surface with channels in the surface.

CLAIMS

1. A microporous polymeric membrane comprising

(a) a first surface, comprising a microporous surface,

(b) a second surface comprising a microporous surface; and

(c) a microporous bulk between the first surface and the second surface;

wherein the membrane has a machine direction and a cross machine direction, and the first surface has a plurality of parallel channels in the machine direction, wherein the channels have side walls and bottom walls, the side walls comprising rough surfaces, the rough surfaces having an Ra in the range of from about 4.5 μin to about 19.0 μin.

2. The membrane of claim 1, wherein the channels have side walls having rougher surfaces than the bottom walls.

3. The membrane of claim 1 or 2, wherein the side walls have rough surfaces having an Ra in the range of about 5 μin to about 9 μin.

4. The membrane of claim 1 or 2, wherein the side walls have rough surfaces having an Ra in the range of about 9.5 μin to about 16.0 μin.

5. The membrane of any one of claims 1-4, wherein at least about 35% of the first surface has the plurality of parallel channels in the machine direction.

6. The membrane of any one of claims 1-5, comprising a sulfone membrane.

7. The membrane of claim 6, comprising a polyethersulfone membrane.

8. The membrane of any one of claims 1-5, comprising a polyamide membrane, or a PVDF membrane.

9. A filter comprising at least one membrane according to any one of claims 1-8.

10. A filter comprising at least two membranes according to any one of claims 1-8.

11. A method of removing undesirable material from a fluid, the method comprising passing the fluid from a first surface of a microporous membrane through a second surface of the membrane, the first surface comprising a microporous surface, the second surface comprising a microporous surface; the membrane having a microporous bulk between the first surface and the second surface; wherein the membrane has a machine direction and a cross machine direction, and the first surface has a plurality of parallel channels in the machine direction, wherein the channels have side walls and bottom walls, the side walls comprising rough surfaces, the rough surfaces having an Ra in the range of from about 4.5 μin to about 19.0 μin.

12. The method of claim 11, comprising removing viruses from a protein containing fluid.

13. A method of removing undesirable material from a fluid, the method comprising passing the fluid through the filter of claim 9.

14. A method of removing undesirable material from a fluid, the method comprising passing the fluid through the filter of claim 10.

15. A method of preparing the membrane of any one of claims 1-8, the method comprising:

obtaining a substrate comprising a surface having a machine direction and a cross machine direction and having parallel abrasions in the surface in the machine direction;

casting a polymeric solution on the surface;

effecting phase separation of the solution and forming a microporous membrane; and,

peeling the membrane from the substrate, wherein portions of the membrane contacting the parallel abrasions in the surface of the substrate are pulled away from the membrane, forming a membrane having a surface with channels in the surface.