Claims

What is claimed is:

1. A composite membrane comprising:

a first porous polymeric layer; and

a second porous polymeric layer laminated with the first porous polymeric layer,

wherein the composite membrane is free of an adhesive.

2. The composite membrane of claim 1, wherein the first porous polymeric layer has a thickness of less than 20 μm.

3. The composite membrane of claim 2, wherein the first porous polymeric layer is a stretched polyethylene layer.

4. The composite membrane of claim 1, wherein the second porous polymeric layer is a polyolefin layer having a thickness of from about 50 μm to about 200 μm.

5. The composite membrane of claim 4, wherein the polyolefin layer is an ultra-high molecular weight polyethylene (UHMWPE) layer.

6. A composite membrane, comprising:

a first region comprising a first porous polymer and having a thickness of less than about 20 μm and

a second region comprising a second porous polymer and having a thickness of from about 50 μm to about 200 μm,

wherein the second porous polymer is different from the first porous polymer, and

wherein there is no interlayer region between the first region and the second region.

7. The composite membrane of claim 6, wherein the first region, the second region, or both the first region and the second region comprise a porous compression region.

8. A method of forming a composite membrane comprising:

i) providing a first porous polymeric layer and a second porous polymeric layer in a laminator;

ii) heating the first porous polymeric layer and the second porous polymeric layer to a lamination temperature in the laminator; and

iii) laminating the heated first porous polymeric layer and the heated second polymeric layer together without an adhesive to form the composite membrane.

9. The method of claim 8, wherein the first porous polymeric layer has a first melting temperature and wherein the first porous polymeric layer is heated to a temperature that is between 5^{o}C and 20^{o}C below the first melting temperature.

10. The method of claim 8, wherein the second porous polymeric layer has a second melting temperature, and wherein the second porous polymeric layer is heated to a temperature that is between 5^{o}C and 20^{o}C below the second melting temperature.

11. A filter comprising the composite membrane of claim 1 or claim 6.