

What is claimed is:

1. A medical article formed from a polyurethane-based resin, which is a random copolymer of a reaction product of the following ingredients:

a diisocyanate;

a diol chain extender;

a polyglycol; and

a modifying oligomer comprising a diol-containing perfluoropolyether, the diol-containing perfluoropolyether being incorporated into a backbone of the polyurethane-based resin formed by the diisocyanate, the polyglycol, and the diol chain extender;—, the diol-containing perfluoropolyether having a structure of

wherein $\text{HO}(\text{CH}_2\text{CH}_2\text{O})_p\text{CH}_2\text{CF}_2\text{O}(\text{CF}_2\text{CF}_2\text{O})_q(\text{CF}_2\text{O})_r\text{CF}_2\text{CH}_2(\text{OCH}_2\text{CH}_2)_p\text{OH}$

wherein $p+q+r$ provide a fluorine content in a range of 55% to 60% by weight and the average molecular weight of the modifying oligomer is in the range of 1500 to 2200 g/mol;

wherein a hard segment content is in the range of from 25% to 75% by weight and a soft segment content of the resin is in the range of from 75% to 25% by weight, the perfluoropolyether being present in the soft segment in an amount in the range of from 0.1 to 10% by weight of the overall resin composition, and the medical article is effective as a self-lubricating and/or self-anti-fouling medical article.

2. The medical article of claim 1, wherein a concentration of the perfluoropolyether at a surface of the medical article is higher than a theoretical concentration of the perfluoropolyether based on uniform distribution of the ingredients.

~~3. The medical article of claim 1, wherein a hard segment content is in the range of from 25% to 75% by weight and a soft segment content of the resin is in the range of from 75% to 25% by weight.~~

~~The medical article of claim 1, wherein the perfluoropolyether is present in a soft segment of the polyurethane-based resin in a backbone in an amount in the range of from 0.1 to 10% by weight of the overall resin composition.~~

4.3. The medical article of claim 1, wherein the modifying oligomer further includes a monofunctional polysiloxane, the monofunctional polysiloxane being incorporated into the polyurethane-based resin as a side chain.

5.4. The medical article of claim 4.3, wherein the polysiloxane is present in a soft segment of the polyurethane-based resin as a side chain in an amount ranging from 0.1 to 9.9% by weight and the perfluoropolyether is present in an amount in the range of from 0.1 to 9.9% by weight of the overall resin composition.

~~6. The medical article of claim 5, wherein the monofunctional polysiloxane comprises monodialcohol-terminated polydimethylsiloxane.~~

7.5. The medical article of claim 1, wherein the polyglycol comprises a polytetramethylene ether glycol and polyethylene glycol 4000, the polyethylene glycol 4000 being present in a soft segment of the polyurethane-based resin in an amount in the range of from 0 to 10% by weight in the overall resin composition.

~~8. The medical article of claim 5, wherein the polyglycol comprises a polytetramethylene ether glycol and polyethylene glycol 4000, the polyethylene glycol 4000 being present in a soft segment of the polyurethane-based resin in an amount in the range of from 0 to 10% by weight, the perfluoropolyether is present in the soft segment in an amount in the range of from 0.1 to 9.9% by weight, and the polysiloxane is present in the soft segment in an amount in the range of from 0.1 to 9.9% by weight of the overall resin composition.~~

~~9. The medical article of claim 1, wherein the diisocyanate is selected from the group consisting of: an aliphatic diisocyanate, alicyclic diisocyanate and an aromatic diisocyanate; and/or the diol chain extender is selected from the group consisting of: ethylene glycol, 1,3-propylene glycol, 1,4-butanediol, neopentyl glycol, and alicyclic glycols having up to 10 carbon atoms; and/or the polyglycol is selected from the group consisting of: polyalkylene glycol, polyester glycol, polycarbonate glycol, and combinations thereof.~~

10.6. The medical article of claim 1, wherein the modifying oligomer is present in the polyurethane-based resin in an amount in the range of from about 0.1 to about 10% by weight of the overall composition of the polyurethane-based resin.

~~11.~~—The medical article of claim 1, wherein the polyurethane-based resin comprises a tensile at break of at least 6000 psi.

~~12.7.~~ The medical article of claim 1, wherein the polyurethane-based resin comprises, and/or an elongation at break of 150% or more.

~~13.8.~~ A medical article formed from a polyurethane-based resin, which is a reaction product of the following ingredients:

a diisocyanate;

a diol chain extender;

a polyglycol; and

a modifying oligomer comprising a monofunctional polysiloxane, the monofunctional polysiloxane being incorporated into as a side chain of the polyurethane-based resin formed by the diisocyanate, the polyglycol, and the diol chain extender;

~~wherein~~ wherein a hard segment content is in the range of from 25% to 75% by weight and a soft segment content of the resin is in the range of from 75% to 25% by weight and the medical article is effective as a self-lubricating and/or self-anti-fouling medical article.

~~14.9.~~ The medical article of claim ~~14~~8, wherein the monofunctional polysiloxane comprises monodialcohol-terminated polydimethylsiloxane.

~~15.10.~~ The medical article of claim ~~14~~8, wherein a concentration of the polysiloxane at a surface of the medical article is higher than a theoretical concentration of the polysiloxane based on uniform distribution of the ingredients.

~~16.~~—The medical article of claim ~~14~~, ~~wherein a hard segment content is in the range of from 25% to 75% by weight and a soft segment content of the resin is in the range of from 75% to 25% by weight.~~

~~17.11.~~ The medical article of claim ~~14~~8, wherein the polysiloxane is present in a soft segment of the polyurethane-based resin as a side chain in an amount in the range of from 0.1 to 10% by weight of the overall resin composition.

~~18.~~—The medical article of claim ~~14~~8, wherein the polyglycol comprises a polytetramethylene ether glycol and polyethylene glycol 4000, the polyethylene glycol 4000 being present in a soft

segment of the polyurethane-based resin in an amount in the range of from 0 to 10% by weight of the overall resin composition.

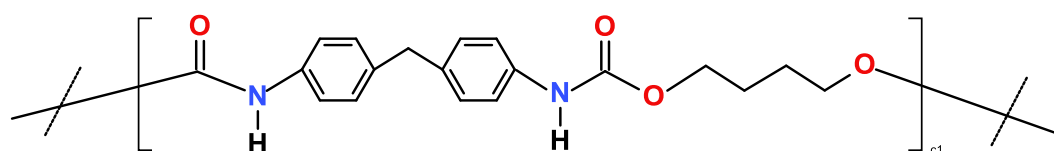
~~19.12.~~ ~~The medical article of claim 14, wherein the;~~ and/or diisocyanate is selected from the group consisting of: an aliphatic diisocyanate, alicyclic diisocyanate and an aromatic diisocyanate, and/or the chain extender is selected from the group consisting of: ethylene glycol, 1,3-propylene glycol, 1,4-butanediol, neopentyl glycol, and alicyclic glycols having up to 10 carbon atoms, and/or the polyglycol is selected from the group consisting of: polyalkylene glycol, polyester glycol, polycarbonate glycol, and combinations thereof.

~~20.13.~~ The medical article of claim ~~148~~, wherein the polysiloxane is present in the polyurethane-based resin in an amount in the range of from about 0.1 to about 10% by weight of the overall composition of the polyurethane-based resin.

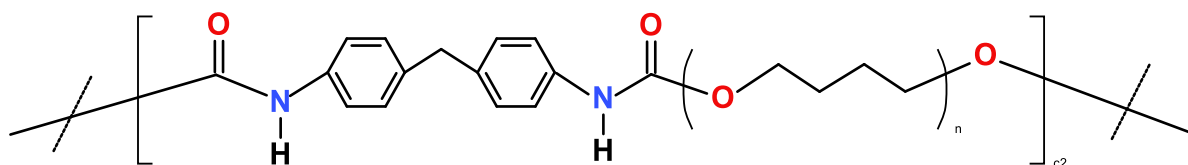
~~21.~~—The medical article of claim ~~148~~, wherein the polyurethane-based resin comprises a tensile at break of at least 6000 psi.

~~22.14.~~ ~~The medical article of claim 14, wherein the polyurethane-based resin comprises, and/or~~ an elongation at break of 150% or more.

~~23.15.~~ A medical article comprising a polyurethane-based resin that is a random copolymer comprising chain segments of (A) and (B), optionally (C), and one or both of (D) and (E) as follows:

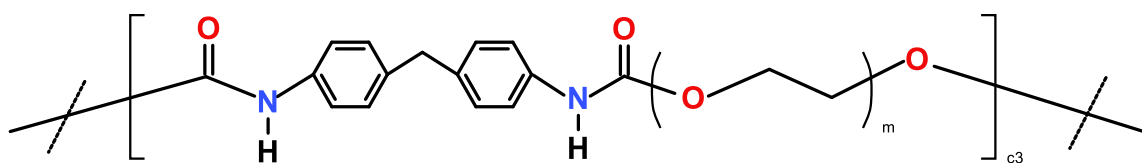


(A)



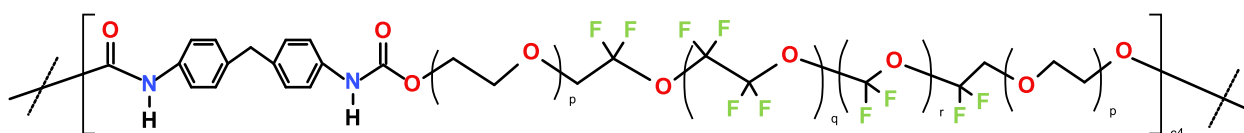
(B)

wherein n is in the range of 3 to 40;



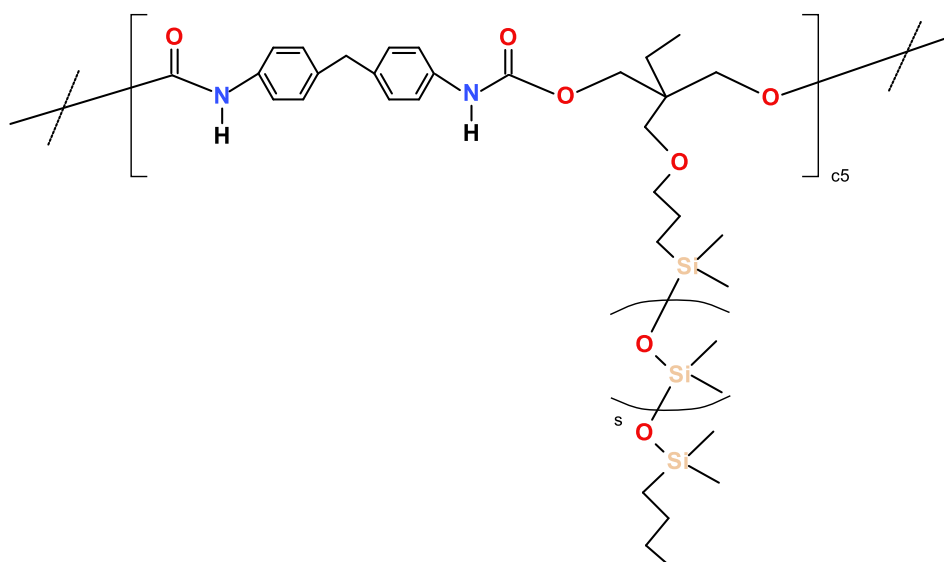
(C)

wherein m is in the range of 4 to 182;



(D)

wherein the total of p+q+r is such that the fluorine content of the oligomer is in the range of 55% to 60% by weight and the average molecular weight of the oligomer is in the range of 1500 to 2200 g/mol;



(E)

wherein s is in the range of 5 to 200;

wherein a hard segment content is in the range of from 25% to 75% by weight and a soft segment content of the resin is in the range of from 75% to 25% by weight.

~~24.16.~~ The medical article of claim ~~2415~~, wherein the random copolymer comprises chain segments of (A), (B), and (D); or (A), (B), (C), and (D).

~~25.~~—The medical article of claim ~~24~~, ~~wherein the random copolymer comprises chain segments of (A), (B), (C), and (D).~~

~~26.~~—~~The medical article of claim 2415~~, wherein the random copolymer comprises chain segments of (A), (B), and (E).

~~27.17.~~ ~~The medical article of claim 24~~, ~~wherein the random copolymer comprises chain segments of~~; or (A), (B), (D), and (E).

~~28.~~—The medical article of claim ~~2415~~, wherein the random copolymer comprises chain segments of (A), (B), (C), and (E).

~~29.18. The medical article of claim 24, wherein the random copolymer comprises chain segments of); or (A), (B), (C), (D), and (E).~~

~~30. A method of infusion therapy comprising: infusing a material from a medical article according to claim 1 into a patient.~~

~~31. The method of claim 31 in the presence or absence of a separate lubricant coated on the medical article.~~

~~32. The method of claim 31 in the presence or absence of a separate anti-fouling agent coated on the medical article.~~

~~33. The method of claim 33 in the absence of a separate anti-fouling agent coated on the medical article, wherein the medical article is effective for a reduced amount of thrombosis formation as compared to a medial article formed from a polyurethane based resin, which is a reaction product of the following ingredients: a diisocyanate; a diol chain extender; a polyglycol in the absence of a modifying oligomer having an alcohol (C-OH) moiety and a functional moiety; wherein a hard segment content is in the range of from 25% to 75% by weight and a soft segment content of the resin is in the range of from 75% to 25% by weight~~