Claims

1. An additive manufacturing polymer precursor composition for forming at least a portion of a polishing article, comprising:

an aliphatic acrylate oligomer;

an aromatic acrylate oligomer;

an acrylate monomer;

a photoinitiator; and

a viscosity thinning reactive diluent to provide the polymer precursor composition with a viscosity that enables the polymer precursor composition to be dispensed to form a portion of the polishing article by use of an additive manufacturing process.

2. The additive manufacturing polymer precursor composition of claim 1, wherein the aromatic oligomer is an aromatic urethane acrylate oligomer.

3. A polymer precursor composition for forming at least a portion of a polishing article, comprising:

a multifunctional aromatic acrylate oligomer;

an acrylate monomer;

a photoinitiator; and

a reactive diluent comprising one or a combination of 2-ethylhexyl acrylate, octyldecyl acrylate, cyclic trimethylolpropane formal acrylate, caprolactone acrylate and alkoxylated lauryl methacrylate,

wherein the polymer precursor composition has a viscosity that enables the polymer precursor composition to be dispensed to form a portion of the polishing article by use of an additive manufacturing process.

4. The additive manufacturing polymer precursor composition of claim 1, wherein the polymer precursor composition is jettable as droplets from a plurality of droplet ejecting nozzles of an additive manufacturing system.

5. The additive manufacturing polymer precursor composition of claim 2, wherein the acrylate monomer has a functionality of two or more.

6. The additive manufacturing polymer precursor composition of claim 1, wherein

a polymer formed only of the polymer precursor composition has a glass transition temperature that is greater than 40° C., and

the polymer precursor composition comprises a greater amount by weight of the multifunctional aliphatic acrylate oligomer than an amount by weight of the acrylate monomer.

7. The additive manufacturing polymer precursor composition of claim 1, wherein a polymer formed of only the polymer precursor composition has a crosslinking density that is greater than 2%.

8. A polymer precursor composition for forming at least a portion of a polishing article, comprising:

one or more aliphatic oligomers selected from a group consisting of aliphatic urethane acrylates, aliphatic hexafunctional urethane acrylates, low viscosity

diacrylates, aliphatic hexafunctional acrylates, and multifunctional urethane acrylates;

one or more aromatic acrylate oligomers or monomers; a photoinitiator selected from a group consisting of benzoin ethers, benzyl ketals, acetyl phenones, alkyl phenones, phosphine oxides, benzophenone compounds, and thioxanthone compounds; and

a reactive diluent selected from a group consisting of 2-ethylhexyl acrylate, octyldecyl acrylate, cyclic trimethylolpropane formal acrylate, caprolactone acrylate and alkoxylated lauryl methacrylate,

wherein the polymer precursor composition has a viscosity that enables the polymer precursor composition to be ejected in droplets from a nozzle of a droplet ejecting additive manufacturing system to form a portion of the polishing article.

9. The polymer precursor composition of claim 8, wherein a polymer formed only of the polymer precursor composition has a glass transition temperature (T.sub.g) that is greater than 40° C.

10. The polymer precursor composition of claim 8, wherein a polymer formed of only the polymer precursor composition has a crosslinking density that is greater than 2%.

11. The polymer precursor composition of claim 8, further comprising an acrylate monomer having a functionality of two or more.

12. The polymer precursor composition of claim 11, wherein the polymer precursor composition comprises a greater amount by weight of the one or more oligomers than an amount by weight of the acrylate monomer.

13. An additive manufacturing polymer precursor composition for forming at least a portion of a polishing article, comprising:

a functional aliphatic acrylate oligomer comprising an aliphatic monofunctional urethane acrylate, an aliphatic monofunctional acrylate, an aliphatic difunctional acrylate, an aliphatic multifunctional urethane acrylate having a functionality that is greater than or equal to 2, or a combination thereof, wherein the functional aliphatic acrylate oligomer has a first viscosity;

a chemical component having an aromatic group;

a photoinitiator; and

a viscosity thinning reactive diluent,

wherein the polymer precursor composition has a second viscosity that is less than the first viscosity, and the polymer precursor composition is printable as droplets from one or more nozzles of an additive manufacturing system to form a portion of the polishing article.

14. The additive manufacturing polymer precursor composition of claim 13, wherein the chemical component having the aromatic group is an acrylate.

15. The additive manufacturing polymer precursor composition of claim 13, wherein the functional aliphatic acrylate oligomer has a functionality of two or more.

16. The additive manufacturing polymer precursor composition of claim 13, wherein the reactive diluent comprises one of 2-ethylhexyl acrylate, octyldecyl acrylate, cyclic trimethylolpropane formal acrylate, caprolactone acrylate, alkoxylated lauryl methacrylate, isobornyl acrylate, decyl acrylate, glycidyl methacrylate, or a combination thereof.

17. The additive manufacturing polymer precursor composition of claim 13, wherein a polymer formed only of the polymer precursor composition has a glass transition temperature (T.sub.g) that is greater than 40° C.

18. The additive manufacturing polymer precursor composition of claim 1, wherein the aliphatic acrylate oligomer comprises an aliphatic monofunctional urethane acrylate, an aliphatic monofunctional acrylate, an aliphatic difunctional acrylate, an aliphatic multifunctional urethane acrylate having a functionality that is greater than or equal to 2, or a combination thereof.