CLAIMS:

1. A formulation for three dimensional (3D) printing of a polishing layer of a polishing pad, comprising:

a parent formulation comprising:

monomer;

a dispersant comprising a polyester derivative; and

nanoparticles dispersed in the parent formulation, wherein the dispersant is less than 6 weight percent of the parent formulation, and wherein the nanoparticles are at least 45 weight percent of the parent formulation.

2. The formulation of claim 1, wherein the nanoparticles comprise ceria or silica nanoparticles.

3. The formulation of claim 1, wherein the monomer is less than 50 weight percent of the parent formulation.

4. The formulation of claim 1, wherein the monomer comprises a methacrylate monomer.

5. The formulation of claim 1, wherein the nanoparticles comprise metal-oxide nanoparticles, and wherein the polyester derivative comprises an ester block and an ether block.

6. The formulation of claim 1, wherein the formulation further comprises a crosslinker, an oligomer, a surface energy modifier, or a rheology modifier, or any combinations thereof.

7. The formulation of claim 6, wherein viscosity of the formulation is less than 17 centipoise (cP) at 70 °C.

8. The formulation of claim 6, wherein the nanoparticles comprise cerium (IV) oxide (CeO2) nanoparticles.

9. The formulation of claim 6, wherein the formulation does not comprise a surfactant.

10. A method of preparing a formulation for additive manufacturing of a polishing pad, comprising:

adding a dispersant comprising a polyester derivative to monomer;

adding metal-oxide nanoparticles to the monomer

subjecting the monomer having the nanoparticles and dispersant to sonication to disperse the nanoparticles in the monomer, wherein the dispersant is less than 6 weight percent of the parent formulation, and wherein the nanoparticles are at least 45 weight percent of the parent formulation.

11. A method of fabricating a polishing pad, comprising:

ejecting droplets of a formulation via a three-dimensional (3D) printer to form a polishing layer of the polishing pad, wherein the formulation comprises monomer, nanoparticles dispersed in the monomer, and a dispersant comprising a polyester derivative; and

polymerizing the monomer as ejected to form the polishing layer, wherein the polishing layer comprises the nanoparticles, wherein the dispersant is less than 6 weight percent of the parent formulation, and wherein the nanoparticles are at least 45 weight percent of the parent formulation.

12. The method of claim 11, wherein the nanoparticles comprise ceria nanoparticles, and wherein the polyester derivative comprises an ester block and an ether block.