Claims

1. A dielectric elastomeric material having a dielectric constant of 20-65 at 10^3 Hz and wherein the dielectric elastomeric material is formed from a composition comprising: a polymer comprising at least one acrylate monomer; a cross-linker; and a photoinitiator, wherein the dielectric elastomeric material has a free end bending angle of ≤ 55°.

2. The dielectric elastomeric material according to claim 1, wherein the dielectric elastomeric material is formed from a composition comprising 5-25 vol % cross-linker based on the total volume of the composition.

3. The dielectric elastomeric material according to claim 1, wherein the at least one acrylate monomer comprised in the composition has a molecular weight of 75-750 g/mol.

4. The dielectric elastomeric material according to claim 1, wherein the dielectric elastomeric material has a Young's modulus of 0.2-0.5 MPa at 20% strain.

5. The dielectric elastomeric material according to claim 1, wherein the dielectric elastomeric material has a glass transition temperature of -15 to -50°C.

6. The dielectric elastomeric material according to claim 1, wherein the dielectric elastomeric material is 3D printable.

7. The dielectric elastomeric material according to claim 1, wherein the at least one acrylate monomer is selected from the group comprising: hydroxypropyl acrylate (HPA), 2-hydroxyethyl acrylate, butyl acrylate, 2-carboxyethyl acrylate, or comonomers thereof.

8. The dielectric elastomeric material according to claim 1, wherein the cross-linker is selected from the group comprising: diethylene glycol, 1,6 hexanediol diacrylate, or mixtures thereof.

9. The dielectric elastomeric material according to claim 1, wherein the composition further comprises a light absorber.

10. A method of forming the dielectric elastomeric material according to claim 1, the method comprising: mixing at least one acrylate monomer with a cross-linker to obtain a mixture; adding a photoinitiator to the mixture to obtain a photocurable mixture; and curing the photocurable mixture to obtain the dielectric elastomeric material.

11. The method according to claim 10, wherein the mixing comprises mixing the at least one acrylate monomer with 5-25 vol % cross-linker based on the total volume of the mixture.

12. The method according to claim 10, wherein the at least one acrylate monomer has a molecular weight of 75-750 g/mol.

13. The method according to claim 10, further comprising adding a light absorber to the mixture prior to the curing.

14. The method according to claim 10, wherein the curing comprises curing under an ultraviolet light source.

15. The method according to claim 10, wherein the method may further comprise 3d-printing the photocurable mixture prior to the curing.

16. A conductive elastomer comprising the dielectric elastomeric material according to claim 1 and an ionic liquid.

17. The conductive elastomer according to claim 16, wherein the ionic liquid is a hydrophobic polar ionic liquid.

18. The conductive elastomer according to claim 16, wherein the conductive elastomer is a near-hysteresis free conductive elastomer.

19. The conductive elastomer according to claim 16, wherein the conductive elastomer is comprised in a sensor.