Claims:

1. A battery comprising a cathode and a composite anode, the composite anode comprising:

a lithium metal anode;

a solid electrolyte; and

at least one interface layer between a surface of the lithium metal anode and a surface of the solid electrolyte, the interface layer formed of a printable lithium composition comprised of lithium metal powder, a polymer binder compatible with the lithium metal powder, a carbon-based rheology modifier compatible with the lithium metal powder, wherein the rheology modifier is dispersible within the composition and provides a three-dimensional support structure for preventing degradation and increasing the durability of the layer, and a solvent compatible with the lithium metal powder and with the polymer binder,

wherein the solvent is selected from the group consisting of acyclic hydrocarbons, cyclic hydrocarbons, aromatic hydrocarbons, symmetrical ethers, unsymmetrical ethers and cyclic ethers, and mixtures, blends or cosolvents thereof,

wherein the interface layer improves the uniformity of the surface of the solid electrolyte thereby optimizing contact between the surface of the lithium metal anode and the surface of the solid electrolyte for better battery performance,

wherein the printable lithium composition has a zero shear viscosity of from 1×10^4 cps to 1×10^7 cps to maintain the lithium metal powder in suspension.

2. The battery of claim 1, wherein the lithium metal anode is formed from a printable lithium composition comprised of lithium metal powder, a polymer binder compatible with the lithium metal powder, a rheology modifier compatible with the lithium metal powder, and a solvent compatible with the lithium metal powder and with the polymer binder.

3. The battery of Claim 2, wherein the printable lithium composition forming the lithium metal anode comprises between 5% to 50% by weight of the lithium metal powder, between 0.1% to 20% by weight of the polymer binder, between 0.1% to 30% by weight of the rheology modifier, and between 50% to 95% by weight of the solvent.

4. The battery of claim 1, wherein the lithium metal anode is a three-dimensional anode.

5. The battery of claim 1, wherein the lithium metal anode is formed from a substrate coated with a printable lithium composition comprising lithium metal powder, a polymer binder compatible with the lithium metal powder, and a rheology modifier compatible with the lithium metal powder and the polymer binder, wherein the rheology modifier provides a three-dimensional support structure for preventing the degradation and increasing the durability of the substrate when coated with the printable lithium composition.

6. The battery of claim 5, wherein the substrate has a three-dimensional porous structure.

7. The battery of claim 1, wherein the cathode is a composite cathode.

8. The battery of claim 7, wherein the composite cathode comprises sulfur.

9. The battery of Claim 1, wherein the printable lithium composition comprises 5% to 50% by weight of the lithium metal powder, between 0.1% to 20% by weight of the polymer binder, between 0.1% to 30% by weight of the rheology modifier, and between 50% to 95% by weight of the solvent.

10. A battery comprising:

a cathode;

an anode comprising a substrate coated with a first printable lithium composition comprising a first lithium metal powder, a first polymer binder compatible with the first lithium metal powder, a first carbon-based rheology modifier compatible with the first lithium metal powder and the first polymer binder providing a three-dimensional support structure for preventing degradation and increasing the durability of the substrate when coated with the printable lithium composition, and a solvent compatible with the lithium metal powder and with the polymer binder,

wherein the solvent is selected from the group consisting of acyclic hydrocarbons, cyclic hydrocarbons, aromatic hydrocarbons, symmetrical ethers, unsymmetrical ethers and cyclic ethers, and mixtures, blends or cosolvents thereof,

wherein the printable lithium composition comprises between 70% to 85% by weight of the lithium metal powder and between 15% to 30% by weight of the polymer binder and the carbon-based rheology modifier; and

at least one interface layer applied to the anode forming a protected composite anode,

wherein the printable lithium composition has a zero shear viscosity of from 1 x 10^4 cps to 1 x 10^7 cps to maintain the lithium metal powder in suspension.

11. The battery of claim 10, wherein the interface layer is formed from a second printable lithium composition comprised of a second lithium metal powder, a second polymer binder compatible with the second lithium metal powder, a second carbon-based rheology modifier compatible with the second lithium metal powder, and a solvent compatible with the second lithium metal powder and with the second polymer binder.

12. The battery of claim 10, wherein the interface layer comprises a foil or film formed from a second printable lithium composition comprising a second lithium metal powder, a second polymer binder compatible with the second lithium metal powder, and a second carbon-based rheology modifier compatible with the second lithium metal powder and the second polymer binder, wherein the second carbon-based rheology modifier is easily dispersible and provides a three-dimensional framework for supporting the second substrate when coated with the second printable lithium composition.