CLAIMS

1. An electrochemical battery cell comprising:

an anode current collector configured as a wire having a predetermined cross-sectional profile;

an anode layer formed and positioned around at least a portion of the anode current collector;

a separator layer formed and positioned around at least some portion of the anode layer;

a cathode layer formed and positioned around at least a portion of the separator layer, the separator layer being configured to prevent electrical contact between the anode layer and the cathode layer;

a cathode current collector formed and positioned around at least a portion of the cathode layer; and

an electrolyte establishing ionic conductivity between the anode layer and the cathode layer, wherein the anode current collector comprises:

a) a non-conductive material at least partially covered with a conductive material; or

b) a carbon based material.

2. The electrochemical battery cell according to Claim 1 a), wherein the anode current collector comprises a metallic material.

3. The electrochemical battery cell according to Claim 1, wherein the anode layer comprises zinc particles dispersed in a polymeric matrix.

4. The electrochemical battery cell according to Claim 1, wherein the separator layer comprises an electrolyte permeable, non-electrically conductive polymeric material.

5. The electrochemical battery cell according to Claim 1, wherein the cathode layer comprises at least one of Ag_20 and MnO_2 in combination with graphite in an ion permeable polymeric binder.

6. The electrochemical battery cell according to Claim 1, wherein the cathode current collector comprises at least one of graphite, silver and nickel filled polymers.

7. The electrochemical battery cell according to Claim 6, wherein the polymers include conductive silicones or fluoropolymers.

8. The electrochemical battery cell according to any one of the preceding Claims, wherein the anode layer is formed from a precursor reducing material that is convertible to a reducing material; and the cathode layer is formed from a precursor oxidizing material that is convertible to an oxidizing material to form a latent battery cell.

9. The electrochemical battery cell according to Claim 1, or Claim 8, further comprising an insulation layer formed and positioned around at least some portion of the cathode current collector.

10. An electrochemical battery cell comprising:

at least one anode current collector configured as a wire having a predetermined cross-sectional profile;

at least one cathode current collector configured as a wire having a predetermined cross-sectional profile, the at least one cathode current collector being positioned adjacent to the at least one anode current collector and separated a predetermined distance, wherein each of the at least one anode current collector and the at least one cathode current collectors are configured as pairs;

an anode layer formed and positioned around at least a portion of the at least one anode current collector;

a cathode layer formed and positioned around at least a portion of the at least one cathode current collector;

a separator layer formed and positioned around some portion of both the anode layer and the cathode layer, the separator layer being configured to prevent electrical contact between the anode layer and the cathode layer; and

an electrolyte establishing ionic conductivity between the anode layer and the cathode layer.

11. The electrochemical battery cell according to Claim 10, wherein the anode layer is formed from a precursor reducing material that is convertible to a reducing material; and the cathode layer is formed from a precursor oxidizing material that is convertible to an oxidizing material.

12. The electrochemical battery cell according to Claim 10, or Claim 11, further comprising an insulation layer formed and positioned around at least some portion of the separator layer.

13. An electrochemical battery cell comprising:

a cathode current collector configured as a wire having a predetermined cross-sectional profile;

a cathode layer formed and positioned around at least a portion of the cathode current collector;

a separator layer formed and positioned around at least some portion of the cathode layer;

an anode layer formed and positioned around at least a portion of the separator layer, the separator layer being configured to prevent electrical contact between the cathode layer and the anode layer;

an anode current collector formed and positioned around at least a portion of the anode layer; and

an electrolyte establishing ionic conductivity between the cathode layer and the anode layer, wherein the anode current collector comprises:

a) a non-conductive material at least partially covered with a conductive material; or
b) a carbon based material.

14. The electrochemical battery cell according to Claim 13, wherein the anode layer is formed from a precursor reducing material that is convertible to a reducing material; and the cathode layer is formed from a precursor oxidizing material that is convertible to an oxidizing material to form a latent battery cell.

15. The electrochemical battery cell according to Claim 13 or Claim 14, further comprising an insulation layer formed and positioned around at least some portion of the anode current collector.

16. A device incorporating an electrochemical battery cell according to any one of the preceding Claims, comprising:

a powerable component having at least one set of positive and negative electrical contacts; and

a wire form electrochemical battery cell incorporated into or on the powerable component, the wire form electrochemical battery cell having an anode current collector and a cathode current collector interconnected to the at least one set of positive and negative electrical contacts, thereby forming a complete circuit.

17. A method for forming an electrochemical cell according to any one of Claims 1-15, for use with a device, the method comprising:

drawing a length of wire form electrochemical battery cell from a supply of the wire form electrochemical battery cell, the wire form electrochemical battery cell comprising an anode current collector and a cathode current collector;

separating a predetermined length of the wire form electrochemical battery cell from the supply of the wire form electrochemical battery cell;

providing a portion of both the anode current collector and the cathode current collector for making electrical contact with a device to be powered; and configuring the wire form electrochemical battery cell into a predetermined shape for use with the device to be powered.

CLAIMS

1. An electrochemical battery cell comprising:

an anode current collector configured as a wire having a predetermined cross-sectional profile;

an anode layer formed and positioned around at least a portion of the anode current collector;

a separator layer formed and positioned around at least some portion of the anode layer;

a cathode layer formed and positioned around at least a portion of the separator layer, the separator layer being configured to prevent electrical contact between the anode layer and the cathode layer;

a cathode current collector formed and positioned around at least a portion of the cathode layer; and

an electrolyte establishing ionic conductivity between the anode layer and the cathode layer, wherein the anode current collector comprises:

a) a non-conductive material at least partially covered with a conductive material; or

b) a carbon based material

wherein the anode layer comprises zinc particles dispersed in a polymeric matrix.

2. The electrochemical battery cell according to Claim 1, wherein the separator layer comprises an electrolyte permeable, non-electrically conductive polymeric material.

3. The electrochemical battery cell according to Claim 1, wherein the cathode layer comprises at least one of Ag_2O and MnO_2 in combination with graphite in an ion permeable polymeric binder.

4. The electrochemical battery cell according to Claim 1, wherein the cathode current collector comprises at least one of graphite, silver and nickel filled polymers.

5. The electrochemical battery cell according to Claim 4, wherein the polymers include conductive silicones or fluoropolymers.

6. The electrochemical battery cell according to any one of the preceding

Claims, wherein the anode layer is formed from a precursor reducing material that is convertible to a reducing material; and the cathode layer is formed from a precursor oxidizing material that is convertible to an oxidizing material to form a latent battery cell.

7. The electrochemical battery cell according to Claim 1, or Claim 6, further comprising an insulation layer formed and positioned around at least some portion of the cathode current collector.

8. An electrochemical battery cell comprising:

at least one anode current collector configured as a wire having a predetermined cross-sectional profile;

at least one cathode current collector configured as a wire having a predetermined cross-sectional profile, the at least one cathode current collector being positioned adjacent to the at least one anode current collector and separated a predetermined distance, wherein each of the at least one anode current collector and the at least one cathode current collectors are configured as pairs;

an anode layer formed and positioned around at least a portion of the at least one anode current collector;

a cathode layer formed and positioned around at least a portion of the at least one cathode current collector;

a separator layer formed and positioned around some portion of both the anode layer and the cathode layer, the separator layer being configured to prevent electrical contact between the anode layer and the cathode layer; and

an electrolyte establishing ionic conductivity between the anode layer and the cathode layer.

9. The electrochemical battery cell according to Claim 8, wherein the anode layer is formed from a precursor reducing material that is convertible to a reducing material; and the cathode layer is formed from a precursor oxidizing material that is convertible to an oxidizing material.

10. The electrochemical battery cell according to Claim 8, or Claim 9, further comprising an insulation layer formed and positioned around at least some portion of the separator layer.

11. An electrochemical battery cell comprising:

a cathode current collector configured as a wire having a predetermined cross-sectional profile;

a cathode layer formed and positioned around at least a portion of the cathode current collector;

a separator layer formed and positioned around at least some portion of the cathode layer;

an anode layer formed and positioned around at least a portion of the separator layer, the separator layer being configured to prevent electrical contact between the cathode layer and the anode layer;

an anode current collector formed and positioned around at least a portion of the anode layer; and

an electrolyte establishing ionic conductivity between the cathode layer and the anode layer, wherein the anode current collector comprises:

a) a non-conductive material at least partially covered with a conductive material; or

b) a carbon based material;

wherein the anode layer is formed from a precursor reducing material that is convertible to a reducing material; and the cathode layer is formed from a precursor oxidizing material that is convertible to an oxidizing material to form a latent battery cell.

12. The electrochemical battery cell according to Claim 11, further comprising an insulation layer formed and positioned around at least some portion of the anode current collector.