CLAIMS

1. A biomedical device including a battery within a biocompatible encapsulation layer, the battery comprising:

an anode current collector, wherein the anode current collector is a first metallic tube closed on a first end;

an anode, wherein the anode chemicals are contained within the first metallic tube;

a cathode current collector, wherein the cathode current collector is a second metallic tube closed on a second end;

a cathode, wherein the cathode chemicals are contained within the second metallic tube;

a ceramic tube with a first sealing surface that sealably interfaces with the first metallic tube and a second sealing surface that sealably interfaces with the second metallic tube;

a sealing material located in a gap between the first sealing surface and first metallic tube; and

a plated metallic battery surface coating, wherein the plated metallic battery surface coating comprises a portion that is plated with electroless plating, and wherein the thickness of the plated metallic battery surface coating is thick enough to act as a barrier to ingress and egress of moisture from the battery;

wherein the sealing material located in the gap between the first sealing surface and the first metallic tube comprises a plurality of thin layers of metallic films, wherein a first thin layer of metallic film is deposited upon a second layer of metallic film, wherein the first thin layer of metallic film is chemically reactive with the second layer of metallic film releasing energy to rapidly heat the layers, and wherein the chemical reaction is activated by an energetic pulse of energy.

2. The biomedical device of Claim 1 wherein the sealing material located in the gap between the first sealing surface and the first metallic tube comprises an epoxy adhesive.

3. The biomedical device of Claim 1 wherein the sealing material located in the gap between the first sealing surface and the first metallic tube comprises a first layer comprising

molybdenum and manganese particles in a mixture with ceramic powders which is then plated with a metallic film.

4. The biomedical device of Claim 3 wherein the metallic film comprises nickel.

5. The biomedical device of Claim 1 wherein the sealing material located in the gap between the first sealing surface and the first metallic tube comprises a first layer of a PVD deposited metallic film.

6. The biomedical device of Claim 5 wherein the metallic film comprises titanium.

7. The biomedical device of Claim 6 wherein a noble metallic film is additionally deposited upon the PVD deposited metallic film.

8. The biomedical device of Claim 1 wherein the energetic pulse comprises photons.

9. The biomedical device of Claim 1 wherein the energetic pulse comprises electrons.

10. The biomedical device of Claim 1 wherein the energetic pulse comprises thermal energy.

11. The biomedical device of Claim 1 wherein the sealing material located in the gap between the first sealing surface and the first metallic tube comprises a conventional solder alloy base with an addition of titanium, wherein the titanium reacts with surface materials of the ceramic upon exposure to ultrasonic energy.

12. A biomedical device including a battery within a biocompatible encapsulation layer, the battery comprising:

an anode current collector, wherein the anode current collector is a first metallic tube closed on a first end;

an anode, wherein the anode chemicals are contained within the first metallic tube;

a cathode current collector, wherein the cathode current collector is a second metallic tube closed on a second end;

a cathode, wherein the cathode chemicals are contained within the second metallic tube;

a glass tube with a first sealing surface that sealably interfaces with the first metallic tube and a second sealing surface that sealably interfaces with the second metallic tube;

a sealing material located in a gap between the first sealing surface and first metallic tube; and

a plated metallic battery surface coating, wherein the plated metallic battery surface coating comprises a portion that is plated with electroless plating, and wherein the thickness of the plated metallic battery surface coating is thick enough to act as a barrier to ingress and egress of moisture from the battery;

wherein the sealing material located in the gap between the first sealing surface and the first metallic tube comprises a plurality of thin layers of metallic films, wherein a first thin layer of metallic film is deposited upon a second layer of metallic film, wherein the first thin layer of metallic film is chemically reactive with the second layer of metallic film releasing energy to rapidly heat the layers, and wherein the chemical reaction is activated by an energetic pulse of energy.

13. The biomedical device of Claim 12 wherein the sealing material located in the gap between the first sealing surface and the first metallic tube comprises an epoxy adhesive.

14. The biomedical device of Claim 12 wherein the sealing material located in the gap between the first sealing surface and the first metallic tube comprises a first layer comprising molybdenum and manganese particles in a mixture with ceramic powders which is then plated with a metallic film.

15. The biomedical device of Claim 14 wherein the metallic film comprises nickel.

16. The biomedical device of Claim 12 wherein the sealing material located in the gap between the first sealing surface and the first metallic tube comprises a first layer of a PVD deposited metallic film.

17. The biomedical device of Claim 16 wherein the metallic film comprises titanium.

18. The biomedical device of Claim 17 wherein a noble metallic film is additionally deposited upon the PVD deposited metallic film.

19. The biomedical device of Claim 12 wherein the energetic pulse comprises photons.

20. The biomedical device of Claim 12 wherein the energetic pulse comprises electrons.

21. The biomedical device of Claim 12 wherein the energetic pulse comprises thermal energy.

22. The biomedical device of Claim 12 wherein the sealing material located in the gap between the first sealing surface and the first metallic tube comprises a conventional solder alloy base with an addition of titanium, wherein the titanium reacts with surface materials of the glass upon exposure to ultrasonic energy.

23. A biomedical device including a battery within a biocompatible encapsulation layer, the battery comprising:

an anode current collector, wherein the anode current collector is a first semiconductor tube closed on a first end and doped on the first end;

an anode, wherein the anode chemicals are contained within the first semiconductor tube;

a cathode current collector, wherein the cathode current collector is a second semiconductor tube closed on a second end and doped on the second end;

a cathode, wherein the cathode chemicals are deposited upon the cathode current collector;

a sealing material located in a gap between the first semiconductor tube and the second semiconductor tube; and

a plated metallic battery surface coating, wherein the plated metallic battery surface coating comprises a portion that is plated with electroless plating, and wherein the thickness of the plated metallic battery surface coating is thick enough to act as a barrier to ingress and egress of moisture from the battery;

wherein the sealing material located in the gap between the first semiconductor tube and the second semiconductor tube comprises a plurality of thin layers of metallic films, wherein

a first thin layer of metallic film is deposited upon a second layer of metallic film, wherein the first thin layer of metallic film is chemically reactive with the second layer of metallic film releasing energy to rapidly heat the layers, and wherein the chemical reaction is activated by an energetic pulse of energy.

24. The biomedical device of Claim 23 wherein the sealing material located in the gap between the first semiconductor tube and the second semiconductor tube comprises an epoxy adhesive.

25. The biomedical device of Claim 23 wherein the sealing material located in the gap between the first semiconductor tube and the second semiconductor tube comprises a first layer comprising molybdenum and manganese particles in a mixture with ceramic powders which is then plated with a metallic film.

26. The biomedical device of Claim 25 wherein the metallic film comprises nickel.

27. The biomedical device of Claim23 wherein the sealing material located in the gap between the first semiconductor tube and the second semiconductor tube comprises a first layer of a PVD deposited metallic film.

28. The biomedical device of Claim 27 wherein the metallic film comprises titanium.

29. The biomedical device of Claim 28 wherein a noble metallic film is additionally deposited upon the PVD deposited metallic film.

30. The biomedical device of Claim 23wherein the energetic pulse comprises photons.

31. The biomedical device Claim 23 wherein the energetic pulse comprises electrons.

32. The biomedical device of Claim 23 wherein the energetic pulse comprises thermal energy.

33. The biomedical device of Claim 23 wherein the sealing material located in the gap between the first semiconductor tube and the second semiconductor tube comprises a conventional solder alloy base with an addition of titanium, wherein the titanium reacts with surface materials of the first semiconductor tube and the second semiconductor tube upon exposure to ultrasonic energy.

34. A method of manufacturing a biomedical device including a battery within a biocompatible encapsulation layer, the steps comprising:

obtaining a cathode collector tube;

filling the cathode collector tube with cathode chemicals;

obtaining an anode collector tube;

filling the anode collector tube with anode chemicals;

obtaining a tube form ceramic insulator piece;

forming a first and second sealing surface on each end of the tube form ceramic insulator piece;

evaporating a metal film upon the first and second sealing surface;

coating the end of the cathode collector tube with a piece of exothermic foil;

coating the metal film upon the first and second sealing surface with a solder paste;

positioning the cathode collector tube over the first sealing surface;

activating the exothermic foil to cause a rapid temperature increase at an interface between the cathode collector tube and the first sealing surface and melting the solder paste;

plating a metallic battery surface coating, wherein at least a first portion of the metallic battery surface coating comprises a portion that is plated with electroless plating, and wherein the thickness of the plated metallic battery surface coating is thick enough to act as a barrier to ingress and egress of moisture from the battery; and

enclosing the battery within the biocompatible encapsulating layer.