What is claimed:

1. An electrochemical cell comprising:

a container;

an organic, non-aqueous electrolyte;

an electrode assembly having an anode consisting essentially of lithium or a lithium alloy strip, a cathode comprising iron disulfide at least partially coated onto both sides of a solid, metallic foil current collector and a separator disposed between the anode and the cathode;

wherein the cell possesses an interfacial anode under-balance and the anode and the cathode are spirally wound so that less than 50% of an outermost surface of the electrode assembly, excluding the separator and optional non-active components, is covered by the anode; and

means for eliminating an edge effect positioned proximate to the cathode in the outermost surface of the electrode assembly that comprises a pore-blocking substance disposed within the cathode coating along an axial strip at a terminal edge of the cathode.

2. An electrochemical cell comprising:

a container;

an organic, non-aqueous electrolyte;

an spirally wound electrode assembly having a separator, an anode consisting essentially of lithium or a lithium alloy strip and a cathode having active material comprising iron disulfide at least partially coated onto both sides of a current collector having a terminal edge oriented on an outermost surface of the spirally wound electrode assembly;

a spacer situated proximate to the terminal edge having a thickness that is: i) at least twice the thickness of the cathode, inclusive of the coating on both sides and the current collector, or ii) greater than a combined thickness of the anode, the cathode and the separator; and

wherein the cell possesses an interfacial anode under-balance and the anode and the cathode are spirally wound so as to have a cathode-outer wrap.

3. The electrochemical cell according to claim 2, wherein the spacer comprises a plurality of members.

4. The electrochemical cell according to claim 3, wherein the members are stacked on top of one another.

5. The electrochemical cell according to claim 3, wherein the members are aligned along an axis that coincides with the terminal edge of the cathode.

6. The electrochemical cell according to claim 2, wherein the spacer comprises an elastomeric material.

What is claimed:

1. An electrochemical cell comprising:

a container;

an organic, non-aqueous electrolyte;

an spirally wound electrode assembly having a separator, an anode consisting essentially of lithium or a lithium alloy strip and a cathode having active material disposed on both sides of a current collector having a terminal edge oriented on an outermost surface of the spirally wound electrode assembly;

wherein the cell the anode and the cathode are spirally wound so that at least 50% of an outermost surface of the electrode assembly, excluding the separator and optional non-active components, is covered by the cathode; and

wherein only one of the following applies: A) the cathode includes a zone of reduced electrochemical reactivity throughout the entire cathode along its terminal edge on an outermost surface of the spirally wound electrode assembly, and B) wherein the cell possesses an interfacial anode under-balance and the anode and the cathode are spirally wound so that at least 50% of an outermost surface of the electrode assembly, excluding the separator and optional non-active components, is covered by the cathode and the cell further comprises spacer is situated proximate to the terminal edge having a thickness that is: i) at least twice the thickness of the cathode, inclusive of the coating on both sides and the current collector, or ii) greater than a combined thickness of the anode, the cathode and the separator.

2. The electrochemical cell according to claim 1, wherein B) applies and wherein the spacer comprises a plurality of members.

3. The electrochemical cell according to claim 2, wherein the members are stacked on top of one another.

4. The electrochemical cell according to claim 3, wherein the members are aligned along an axis that coincides with the terminal edge of the cathode.

5. The electrochemical cell according to claim 1, wherein B) applies and wherein the spacer comprises an elastomeric material.

6. The electrochemical cell according to claim 1, wherein A) applies and wherein the cathode is a porous cathode comprising an active material containing iron disulfide or manganese dioxide disposed onto both sides of a metallic current collector and a separator disposed between the anode and the cathode.

7. The electrochemical cell according to claim 6, wherein the zone of reduced electrochemical reactivity is characterized by a reduction or elimination of ionic conductivity of cathode pores within the zone.

8. The electrochemical cell according to claim 6, wherein the zone of reduced electrochemical reactivity is created by a spacer having a thickness that is: i) at least twice the thickness of the cathode, inclusive of the coating on both sides and the current collector, or ii) greater than a combined thickness of the anode, the cathode and the separator inserted between the anode and the cathode proximate to the terminal edge of the cathode.

9. A method for making a cathode outer wrap battery which does not experience premature voltage drop-off upon intermittent discharge of the battery, the method comprising:

continuously coating a cathode mixture comprising iron disulfide onto both sides of a solid foil current collector and subsequently creating a plurality of zones of reduced electrochemical activity on at least one side of the current collector;

cutting the coated cathode into individual strips to create a plurality of individual cathodes so that the zone of reduced electrochemical activity is positioned at a terminal end of each individual cathode;

providing a separator and an anode consisting essentially of lithium or a lithium alloy wherein the anode does not include a current collector;

spirally winding the anode, the individual cathode strip and the separator into a electrode assembly so that at least 50% of an outermost surface of the electrode assembly,

excluding the separator and optional non-active components, is covered by the cathode and the zone of reduced electrochemical activity is situated along the outermost surface of the electrode assembly; and

disposing the electrode assembly in a conductive container, introducing a non-aqueous electrolyte to the container and closing the container.

10. The method according to claim 9, wherein the zone of reduced electrochemical activity is created by creating a mass free zone prior to disposing the electrode assembly in the container.

11. The method according to claim 10, wherein the mass free zone is created by providing a sacrificial substrate to the current collector prior to coating the cathode mixture and then removing the sacrificial substrate subsequent to coating the cathode mixture.

12. The method according to claim 10, wherein the mass free zone is created by physically removing the cathode coating as the cathode is cut into individual strips.

13. The method according to claim 9, wherein the zone of reduced electrochemical activity is created by discharging the cathode in the zone prior to disposing the electrode assembly in the container.

14. The method according to claim 9, wherein the zone of reduced electrochemical activity is created by insulating the cathode mixture from ionic conductivity within the zone prior to disposing the electrode assembly in the container.

15. The method according to claim 9, wherein the zone of reduced electrochemical activity is created by reducing an amount of active cathode material in the zone prior to disposing the electrode assembly in the container.

16. The method according to claim 9, wherein the amount of cathode active material is reduced by reducing the thickness of the cathode coating.

17. The method according to claim 9, wherein the zone of reduced electrochemical activity is created by utilizing an initiator to induce a change within the cathode.

18. The method according to claim 17, wherein the initiator is selected from radiation, electromagnetic radiation or a light source.

19. The method according to claim 17, wherein the cathode mixture includes a chemical which reacts with or to the initiator.

20. The method according to claim 9, wherein the zone of reduced electrochemical activity is created by providing a spacer having a thickness that is: i) greater than a combined thickness of the anode, the cathode and the separator, or ii) at least twice the thickness of the cathode, inclusive of the coating on both sides and the current collector between the anode and the individual cathode strip proximate to the terminal end.

21. The method according to claim 9, wherein the zone of reduced electrochemical activity is created by relieving electrode stack pressure at the terminal end as the cell discharged.

22. The method according to claim 9, wherein the anode is provided in an amount to create an interfacial, theoretical anode-to-cathode input capacity ratio that is less than 1.0.