What is claimed:

1. An electrochemical cell comprising:

a cylindrical container having positive and negative terminals;

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 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;

wherein the cathode at the outermost surface includes a terminal edge oriented in a substantially axial direction relative to the cylindrical container; and

wherein the anode has a substantially uniform thickness except for a localized area of increased thickness directly underneath the terminal edge of the cathode.

2. The electrochemical cell according to claim 1, wherein the localized area of increased thickness is at least 150% of a thickness of the remaining anode.

3. The electrochemical cell according to any preceding claim, wherein the localized area of increased thickness comprises further comprises one selected from the group consisting of: a) a lithium or lithium-alloy patch, oriented in the axial direction and attached to an outermost wind of the anode directly underneath the terminal edge of the cathode, and wherein the second lead is attached to the outermost wind of the anode on the outermost surface of the electrode assembly; and b) a lithium or a lithium alloy combined patch-lead, oriented in the axial direction and attached to the anode, and wherein the combined patch-lead acts as the second lead for the cell.

4. The electrochemical cell according to claim 3, wherein the patch or the combined patch-lead further comprises a support member positioned so as to still permit direct physical

contact between the lithium or lithium alloy of the anode and the lithium or lithium alloy of the patch or the combined patch-lead.

5. The electrochemical cell according to claim 4, wherein the support member is made from at least one polymeric material selected from the group consisting of: a polyolefin, polyethylene, polypropylene, polyimide and polyester.

6. The electrochemical cell according to claim 3, wherein the combined patch-lead is present and attached to an inner wind of the anode within the electrode assembly.

7. The electrochemical cell according to claim 3, wherein the patch is present and attached to an outer-facing side of the anode.

8. The electrochemical cell according to claim 3, wherein the patch is present and formed as a plurality of individual pieces of lithium spaced apart along the axial direction.

9. A method for improving the discharge capacity of a lithium-iron disulfide cylindrical electrochemical cell, the method comprising:

providing a lithium-iron disulfide electrochemical cell with a spiral wound electrode assembly having an outermost surface, excluding the separator and optional non-active components, that is at least 50% covered by a cathode strip;

creating a localized area of increased thickness in the anode strip and positioning said localized area of increased thickness proximate to an outermost terminal edge of the cathode strip within the electrode assembly; and

causing the cell to be discharged.

10. The method according to claim 9, wherein the creating a localized area of increased thickness comprises providing a lithium or lithium alloy patch to an anode strip within the electrode assembly proximate to an outermost terminal edge of the cathode strip.

11. The method according to claim 9, wherein the creating a localized area of increased thickness comprises forming a plurality of individual pieces of lithium spaced apart along the axial direction.

What is claimed:

1. An electrochemical cell comprising:

a cylindrical container having positive and negative terminals;

an organic, non-aqueous electrolyte;

an electrode assembly having an anode consisting essentially of lithium or a lithium alloy strip having a thickness, 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;

a first lead establishing electrical connection between the cathode to the positive terminal and a second lead establishing electrical connection between the anode to the negative terminal;

wherein 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 the cathode at the outermost surface includes a terminal edge oriented in a substantially axial direction relative to the cylindrical container and the electrode assembly further comprises one selected from the group consisting of: a) a lithium or lithium-alloy patch, oriented in the axial direction and attached to an outermost wind of the anode directly underneath the terminal edge of the cathode, and wherein the second lead is attached to the outermost wind of the anode on the outermost surface of the electrode assembly; and b) a lithium or a lithium alloy combined patch-lead, oriented in the axial direction and attached to the anode, and wherein the combined patch-lead acts as the second lead for the cell.

2. The electrochemical cell of claim 1, wherein the patch or the combined patch-lead has a thickness that is at least one half of the thickness of the anode.

3. The electrochemical cell of claim 1, wherein the patch or the combined patch-lead further comprises a support member positioned so as to sustain direct physical contact between the lithium or lithium alloy of the anode and the lithium or lithium alloy of the patch or the combined patch-lead.

4. The electrochemical cell of claim 3, wherein the support member is made from at least one polymeric material selected from the group consisting of: a polyolefin, polyethylene, polypropylene, polyimide and polyester.

5. The electrochemical cell of claim 1, wherein the combined patch-lead is present and attached to an inner wind of the anode within the electrode assembly.

6. The electrochemical cell of claim 1, wherein the patch is present and attached to an outer-facing side of the anode.

7. The electrochemical cell of claim 1, wherein the patch is present and formed as a plurality of individual pieces of lithium spaced apart along the axial direction.

8. An electrochemical cell comprising:

a cylindrical container having positive and negative terminals;

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 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;

wherein the cathode at the outermost surface includes a terminal edge oriented in a substantially axial direction relative to the cylindrical container; and

wherein the anode has a substantially uniform thickness except for a localized area of increased thickness directly underneath the terminal edge of the cathode.

9. The electrochemical cell of claim 8, wherein the localized area of increased thickness is at least 150% of a thickness of the remaining anode.

10. The electrochemical cell of claim 8, wherein the localized area of increased thickness comprises a lithium patch affixed to an inner-facing or an outer-facing surface of the anode at a point directly underneath the terminal edge of the cathode.

11. The electrochemical cell of claim 10, wherein the lithium patch further comprises a support member positioned so as to still permit direct physical contact between the lithium or lithium alloy of the anode and the lithium or lithium alloy of the lithium patch.

12. The electrochemical cell of claim 10, wherein the support member is made from at least one polymeric material selected from the group consisting of: a polyolefin, polyethylene, polypropylene, polyimide and polyester.

13. The electrochemical cell of claim 10, wherein the patch is formed as a plurality of individual pieces of lithium spaced apart along the axial direction.

14. A method for improving the discharge capacity of a lithium-iron disulfide cylindrical electrochemical cell, the method comprising:

providing a lithium-iron disulfide electrochemical cell with a spiral wound electrode assembly having an outermost surface, excluding the separator and optional non-active components, that is at least 50% covered by a cathode strip;

creating a localized area of increased thickness in the anode strip and positioning said localized area of increased thickness proximate to an outermost terminal edge of the cathode strip within the electrode assembly; and causing the cell to be discharged.

15. The method according to 14, wherein the creating a localized area of increased thickness comprises providing a lithium or lithium alloy patch to an anode strip within the electrode assembly proximate to an outermost terminal edge of the cathode strip.