Claims:

1) A method for assembling a metal/air cell, comprising the steps of:

(i) providing an air cathode assembly that comprises hydrophobic porous film having a first face and a second face, with a current collector and catalyst-containing active layer provided on said first face, with the planar dimensions of the catalyst-containing active layer being smaller than that of said film and the current collector, such that the catalyst-containing active layer does not reach the edges of said film and current collector, thereby creating a catalyst-free margin on the film and current collector, which surrounds the catalyst-containing active layer;

(ii) placing said cathode assembly atop of a cell frame defining an electrolyte chamber, with a thermoplastic body that is capable of softening to a mobile, flowable state upon heating to an elevated temperature being positioned between said cell frame and said cathode assembly, wherein the thermoplastic body coincides in geometrical shape and position with said catalyst-free margin area and essentially coincides also in width with said catalyst free-margin;

(iii) applying heat and pressure to soften the thermoplastic body and forcing a thermoplastic melt to flow in the direction of the pores in the catalyst-free margin of the hydrophobic porous film, thereby welding the air cathode assembly and the frame of the cell upon solidification of the melt.

2) A method according to claim 1, wherein the thermoplastic body comprises a raised region of the cell frame protruding from the surface of the frame, said raised region forming an integral part of the frame.

3) A method according to claim 2, which comprises a step of applying hot melt polyolefin onto the surface of the cell

frame adjacent to, and in outward direction from, the raised region of the cell frame.

4) A method according to any one of claims 1 to 3, wherein the thermoplastic body is polypropylene body.

5) A method according to any one of claims 1 to 4, wherein the thermoplastic body softens at a temperature in the range from 120 to 280°C.

6) A method according to any one of claims 1 to 5, wherein the air cathode and the frame of the cell are welded by coating of the current collector with the molten thermoplastic and/or by penetration of the molten thermoplastic into the pores of the hydrophobic film in the catalyst-free margin.

7) A method according to any one of claims 1 to 6, wherein the hydrophobic film is PTFE film.

8) A metal-air electrochemical cell comprising a frame defining an electrolyte chamber having an anode side and a cathode side, wherein an air cathode assembly is provided in the cathode side, said air cathode assembly comprising hydrophobic porous film having a first face and a second face, with current collector and catalyst-containing active layer provided on said first face, with the planar dimensions of the catalyst-containing active layer on said first face being smaller than that of said hydrophobic film and said current collector, such that the catalyst-containing active layer does not reach the edges of said hydrophobic film and said current collector, thereby creating a catalyst-free margin on the hydrophobic film and current collector which surrounds the catalyst-containing active layer, and wherein said first face of the hydrophobic film and said frame of the cell are joined

together by thermoplastic applied onto the catalyst-free margin of the hydrophobic film.

9) A metal-air electrochemical cell according to claim 8, wherein the thermoplastic coats the current collector and/or penetrates to the pores of the hydrophobic film in said catalyst-free margin.

10) A metal-air electrochemical cell according to claim 8 or 9, wherein the thermoplastic comprises polypropylene.

11) A metal-air electrochemical cell according to claim 10, wherein the thermoplastic comprises polypropylene and a second polyolefin.

12) A metal-air electrochemical cell according to any one of claims 8 to 11, wherein the hydrophobic porous film is PTFE film.

13) A metal-air electrochemical cell according to claim 12, characterized in that EDX spectroscopy indicates variation in the relative proportion between fluorine and carbon across the thickness of the PTFE film in said catalyst-free margin area, identifying segments in the film where carbon and fluorine are the major and minor chemical elements, respectively.

14) An electrode assembly comprising PTFE film having a first face and a second face, with current collector and catalyst-containing active layer provided on said first face, with the planar dimensions of the catalyst-containing active layer being smaller than that of said PTFE film and said current collector, such that the catalyst-containing active layer does not reach the edges of the PTFE film and current collector, thereby creating a catalyst-free margin on the PTFE film and

current collector which surrounds the catalyst-containing active layer, characterized in that a thermoplastic is applied onto said first face in the catalyst-free margin area, and further characterized in that EDX spectroscopy indicates variation in the relative proportion between fluorine and carbon across the thickness of the PTFE film in said catalyst-free margin area, identifying segments in the film where carbon and fluorine are the major and minor chemical elements, respectively.

CLAIMS

1. A method for assembling a metal/air cell, comprising the steps of:

(i) providing an air cathode assembly that comprises hydrophobic porous film having a first face and a second face, with a current collector and catalyst-containing active layer provided on the first face, with the planar dimensions of the catalyst-containing active layer being smaller than that of the film and the current collector, such that the catalyst-containing active layer does not reach the edges of the film and current collector, thereby creating a catalyst-free margin on the film and current collector, which surrounds the catalyst-containing active layer;

(ii) placing the cathode assembly atop of a cell frame defining an electrolyte chamber, with a thermoplastic body that is capable of softening to a mobile, flowable state upon heating to an elevated temperature being positioned between the cell frame and the cathode assembly, in which the thermoplastic body coincides in geometrical shape and position with the catalyst-free margin area and essentially coincides also in width with the catalyst free-margin;

(iii) applying heat and pressure to soften the thermoplastic body and forcing a thermoplastic melt to flow in the direction of the pores in the catalyst-free margin of the hydrophobic porous film, thereby welding the air cathode assembly and the frame of the cell upon solidification of the melt,

in which the thermoplastic body comprises a raised region of the cell frame protruding from the surface of the frame, the raised region forming an integral part of the frame.

2. A method according to Claim 1, which comprises a step of applying hot melt polyolefin onto the surface of the cell frame adjacent to, and in outward direction from, the raised region of the cell frame.

3. A method according to Claim 1 or 2, in which the thermoplastic body is polypropylene body.

4. A method according to Claim 1, 2 or 3, in which the thermoplastic body softens at a temperature in the range from 120 to 280°C.

5. A method according to any preceding claim, in which the air cathode and the frame of the cell are welded by coating of the current collector with the molten thermoplastic and/or by

penetration of the molten thermoplastic into the pores of the hydrophobic film in the catalyst-free margin.

6. A method according to any preceding claim, in which the hydrophobic film is PTFE film.