CLAIMS

What is claimed is:

1. A method of drying an electrode assembly, comprising steps of:

1) stacking at least one anode, at least one cathode, and at least one separator interposed between the at least one anode and at least one cathode to prepare an electrode assembly;

2) placing the electrode assembly in a drying chamber;

3) drying the electrode assembly under vacuum at a temperature from about 80 °C to about 155 °C;

4) filling the drying chamber with dry air or inert gas; and

5) repeating steps 3) and 4) to obtain a dried electrode assembly,

wherein water content of the dried electrode assembly is less than 20 ppm by weight, based on total weight of the dried electrode assembly.

2. The method of claim 1, wherein the electrode assembly is dried under vacuum for a time period from about 5 minutes to about 4 hours.

3. The method of claim 1, wherein the electrode assembly is dried under vacuum for a time period from about 30 minutes to about 2 hours.

4. The method of claim 1, wherein the pressure in the drying chamber in step 3) is reduced to less than 25 kPa.

5. The method of claim 1, wherein the pressure in the drying chamber in step 3) is reduced to less than 15 kPa.

6. The method of claim 1, wherein the pressure in the drying chamber in step 3) is reduced to less than 10 kPa.

7. The method of claim 1, wherein the pressure in the drying chamber in step 3) is reduced to less than 5 kPa.

8. The method of claim 1, wherein the dry air or inert gas restores the drying

chamber to atmospheric pressure.

9. The method of claim 1, wherein the temperature of the dry air or inert gas is from about 70 °C to about 155 °C.

10. The method of claim 1, wherein the temperature of the dry air or inert gas is from about 80 °C to about 120 °C.

11. The method of claim 1, wherein the dry air or inert gas stays in the drying chamber for a time period from about 5 minutes to about 2 hours.

12. The method of claim 1, wherein the dry air or inert gas stays in the drying chamber for a time period from about 15 minutes to about 30 minutes.

13. The method of claim 1, wherein steps 3) and 4) are repeated between 2 and 50 times, between 2 and 30 times, or between 2 and 20 times.

14. The method of claim 1, wherein the at least one anode and at least one cathode in the dried electrode assembly have a water content of less than 20 ppm by weight, based on the total weight of the at least one dried anode and at least one dried cathode.

15. The method of claim 1, wherein the at least one anode and at least one cathode in the dried electrode assembly have a water content of less than 10 ppm by weight, based on the total weight of the at least one dried anode and at least one dried cathode.

16. The method of claim 1, wherein the at least one separator in the dried electrode assembly has a water content of less than 20 ppm by weight, based on the total weight of the at least one dried separator.

17. The method of claim 1, wherein the at least one separator in the dried electrode assembly has a water content of less than 10 ppm by weight, based on the total weight of the at least one dried separator.

18. The method of claim 1, wherein the at least one separator is made of polymeric fibers selected from the group consisting of polyolefin, polyethylene, high-density polyethylene, linear low-density polyethylene, low-density polyethylene,

ultrahigh-molecular-weight polyethylene, polypropylene, polypropylene/polyethylene co-polymer, polybutylene, polypentene, polyacetal, polyamide, polycarbonate, polyimide, polyetherether ketone, polysulfones, polyphenylene oxide, polyphenylene sulfide, polyacrylonitrile, polyvinylidene fluoride, polyoxymethylene, polyvinyl pyrrolidone, polyester, polyethylene terephthalate, polybutylene terephthalate, polyethylene naphthalene, polybutylene naphthalate, and combinations thereof.

19. The method of claim 1, wherein each of the at least one anode and at least one cathode independently comprises a binder material selected from the group consisting of styrene-butadiene rubber, acrylated styrene-butadiene rubber, acrylonitrile copolymer, acrylonitrile-butadiene rubber, nitrile butadiene rubber, acrylonitrile-styrene-butadiene copolymer, acryl rubber, butyl rubber, fluorine rubber, polytetrafluoroethylene, polyethylene, polypropylene, ethylene/propylene copolymers, polybutadiene, polyethylene oxide, chlorosulfonated polyethylene, polyvinylpyrrolidone, polyvinylpyridine, polyvinyl alcohol, polyvinyl acetate, polyepichlorohydrin, polyphosphazene, polyacrylonitrile, polystyrene, latex, acrylic resins, phenolic resins, epoxy resins, carboxymethyl cellulose, hydroxypropyl cellulose, cellulose acetate, cellulose acetate butyrate, cellulose acetate propionate, cyanoethylcellulose, cyanoethylsucrose, polyester, polyamide, polyether, polyimide, polycarboxylate, polycarboxylic acid, polyacrylic acid, polyacrylate, polymethacrylic acid, polymethacrylate, polyacrylamide, polyurethane, fluorinated polymer, chlorinated polymer, a salt of alginic acid, polyvinylidene fluoride, poly(vinylidene fluoride)-hexafluoropropene, and combinations thereof.