CLAIMS

1. An electrochemical cell comprising a cathode and an anode disposed in a housing, each of the cathode and anode being a planar structure that extends~~ing~~ radially outward from a region proximate to a solid core extending along a central axis of the housing, the cathode and anode alternating in a circular path defined about the solid core in a plane perpendicular to a flow axis through the electrochemical cell, an active surface area of the anode being greater than a surface area of an internal surface of the housing, and an active surface area of the cathode being greater than ~~a~~ the surface area of ~~an~~ the internal surface of the housing.

2. The electrochemical cell of claim 1, ~~including a plurality of cathodes and a plurality of anodes extending radially outward from the region proximate the central axis of the housing, with~~ wherein a fluid passageway is defined between ~~each adjacent~~ the cathode and the anode, the fluid ~~channels~~ passageway extending substantially parallel to the central axis.

3. The electrochemical cell of claim 2, further comprising a gas conduit positioned circumferentially outside of the fluid passageway within the housing.

~~3~~4. The electrochemical cell of claim 1, wherein one of the ~~plurality of~~ cathode~~s~~ and the ~~plurality of~~ anode~~s~~ are rigid electrodes.

~~4~~5. The electrochemical cell of claim ~~3~~4, wherein the ~~plurality of anodes~~ cathode and the ~~plurality of cathodes~~ anode each comprise one or more of titanium, nickel, and aluminum.

~~5~~6. The electrochemical cell of claim ~~3~~4, wherein the ~~plurality of~~ anode~~s~~ include~~s~~ surfaces coated with an oxidation resistant coating selected from the group consisting of platinum, a mixed metal oxide, magnetite, ferrite, cobalt spinel, tantalum, palladium, iridium, gold, and silver.

~~6~~7. The electrochemical cell of claim ~~2~~1, wherein the ~~plurality of~~ anode~~s~~ and ~~the plurality of~~ cathode~~s~~ include one or more gas diffusion electrodes.

~~7. The electrochemical cell of claim 6, further comprising a central gas conduit defined along the central axis of the housing.~~

8. The electrochemical cell of claim 1, wherein the anode and the cathode are provided in plurality, and wherein the plurality of cathodes comprise multiple gas diffusion electrodes for each anode of the plurality of anodes or the plurality of anodes comprise multiple gas diffusion electrodes for each cathode of the plurality of cathodes.

~~8~~9. The electrochemical cell of claim ~~7~~1, further comprising axial gas conduits radially displaced from the central axis of the housing.

~~9. The electrochemical cell of claim 8, comprising one of multiple gas diffusion cathodes per each anode and multiple gas diffusion anodes for each cathode.~~

~~10. The electrochemical cell of claim 8, wherein the central gas conduit is configured to deliver gas to first surfaces of the plurality of cathodes and the electrochemical cell further comprises a plurality of radial gas conduits configured to deliver gas to second surfaces of the plurality of cathodes.~~

~~11. The electrochemical cell of claim 1, including a first end cap coupled to a first end of the housing and including apertures disposed proximate an outer circumference of the first end cap and a second end cap coupled to a second end of the housing and including a substantially centrally located aperture, the apertures of the first end cap in fluid communication with the fluid channels, the aperture of the second end cap in fluid communication with a central fluid conduit of the electrochemical cell.~~

~~12. The electrochemical cell of claim 11, further comprising a gas conduit provided circumferentially outside of the fluid channels within the housing.~~

~~13~~10. The electrochemical cell of claim 1, wherein at least one of the ~~plurality of~~ cathode~~s and the plurality of~~ or anode~~s~~ are corrugated.

~~14~~11. The electrochemical cell of claim 1, wherein at least one of the anode and the cathode is fluid permeable.

~~15~~12. The electrochemical cell of claim 1, further comprising a separator configured to maintain a gap between the anode and the cathode, the separator being open to flow of an electrolyte solution through the gap in a direction substantially parallel to the central axis.

~~16~~13. The electrochemical cell of claim 1, further comprising an electrical connector in electrical communication with one of the anode and the cathode, the electrical connector comprising including a first material ~~having a high degree of resistance to chemical attack by electrolyte solutions~~ and a second material, the second material having a lower degree of resistance to chemical attack by electrolyte solutions than the first material, the first material at least partially disposed within the housing~~,~~ and the second material at least partially disposed outside of the housing.

~~17~~14. The electrochemical cell of claim ~~16~~13, wherein the electrical connector includes a fluid permeable body formed of the first material.

~~18~~15. The electrochemical cell of claim ~~17~~14, comprising a body of the second material coupled to the fluid permeable body formed of the first material with one or more mechanical fasteners.

~~19~~16. The electrochemical cell of claim ~~17~~14, comprising a body of the second material coupled to the fluid permeable body formed of the first material with a compression fit.

~~20~~17. The electrochemical cell of claim ~~17~~14, comprising a body of the second material coupled to the fluid permeable body formed of the first material with threads formed in an edge of the fluid permeable body formed of the first material.

~~21~~18. The electrochemical cell of claim ~~17~~14, comprising a body formed of the second material coupled to the fluid permeable body formed of the first material with threads formed in cylindrical portion of the body formed of the second material.

~~22~~19. The electrochemical cell of claim ~~17~~14, comprising a body formed of the second material welded to the body formed of the first material.

20. The electrochemical cell of claim 1, having an overall electrode packing density of at least about 2 mm^{-1}.

21. The electrochemical cell of claim 1, wherein the solid core is formed from a non-conductive material.

22. The electrochemical cell of claim 21, wherein the non-conductive material is at least one of polyvinyl chloride (PVC), polytetrafluoroethylene (PTFE), polyvinylidene fluoride (PVDF), acrylonitrile butadiene styrene (ABS), or high-density polyethylene (HDPE).

23. The electrochemical cell of claim 1 the housing further comprising a plurality of baffles configured to control a direction of flow of a fluid.

24. The electrochemical cell of claim 1 wherein each of the anode and the cathode comprise an expanded mesh.

~~23~~25. A system comprising:

the electrochemical cell of claim 1;

a source of electrolyte in fluid communication with the electrochemical cell, the electrochemical cell configured to produce one or more reaction products from electrolyte from the source of electrolyte and to output a product including the one or more reaction products; and

a point of use for the one or more reaction products output by the electrochemical cell.

~~24~~26. The system of claim ~~23~~25, wherein the one or more reaction products includes a disinfectant.

~~25~~27. The system of claim ~~24~~26, wherein the disinfectant includes sodium hypochlorite.

~~26~~28. The system of claim ~~23~~25, wherein the source of electrolyte comprises seawater.

~~27~~29. The system of claim ~~26~~25, included in one of a ship ~~and~~ or an oil platform.

~~28~~30. The system of claim ~~27~~29, wherein the point of use includes one of a cooling water system ~~and~~ or a ballast tank.

~~29~~31. The system of claim ~~23~~25, included in a land-based oil drilling system, wherein the point of use is a downhole of the oil drilling system.