What is claimed is:

CLAIMS

1. A system comprising:

a self-cleaning electrochemical cell comprising:

a plurality of electrodes disposed concentrically in a housing about a central axis of the housing;

a fluid channel defined between adjacent electrodes of the plurality of electrodes and extending substantially parallel to the central axis; and

an electrical connector positioned at a distal end of at least one of the plurality of electrodes and electrically connected to the at least one of the plurality of electrodes,

the electrical connector being dimensioned to allow fluid flow through the fluid channel and provide a substantially even current distribution to the at least one of the plurality of electrodes while maintaining a zone of reduced velocity having less than a predetermined length within the fluid channel downstream of the electrical connector, the zone of reduced velocity defined by a region in the fluid channel in which fluid flow velocity deviates from a mean fluid flow velocity in the channel by within 20%; or

a self-cleaning electrochemical cell comprising:

a plurality of electrodes disposed concentrically in a housing about a central axis of the housing;

a fluid channel defined between adjacent electrodes and extending substantially parallel to the central axis; and

an electrical connector positioned at a distal end of an electrode of the plurality of electrodes and electrically connected to the electrode, the electrical connector being dimensioned to allow fluid flow through the channel and configured to cause a temperature of electrolyte flowing through the fluid channel at about 2 m/s and having a temperature of about 20 ºC to increase by less than about 0.5 ºC while transmitting at least 100 W of power to the at least one of the plurality of electrodes,

the self-cleaning electrochemical cell having an inlet and an outlet in fluid communication with the fluid channel; and

a source of the electrolyte solution having an outlet fluidly connectable to the inlet of the self-cleaning electrochemical cell and configured to deliver the electrolyte solution at an average flow velocity through the fluid channel of 2 m/s or greater,

the self-cleaning electrochemical cell configured to produce a product compound from the electrolyte solution and to output a product solution comprising the product compound,

the self-cleaning electrochemical cell being fluidly connectable to a point of use through the outlet, wherein the source of the electrolyte solution comprises at least one of seawater, brackish water, and brine.