What is claimed is:

CLAIMS

1. An electrochemical water treatment device fluidly connectable to a source of water to be treated having weakly ionized species, comprising:

an electrochemical separation module fluidly connectable to the source of water to be treated, the electrochemical separation module comprising a first electrode, a second electrode, and a plurality of dilution compartments,

each of the dilution compartments including a first region of ion exchange media having a first average particle size, a second region of ion exchange media having a second average particle size, and a third region of ion exchange media having a third average particle size,

a volume of the second region of ion exchange media being greater than or equal to a total volume of the first and third regions of ion exchange media.

2. The device of claim 1, constructed and arranged to provide for greater than or equal to a 3-log removal of the weakly ionized species with a pressure drop of between about 30 psi and 70 psi in a single pass through the electrochemical water treatment device.

3. The device of claim 2, wherein the second average particle size is less than the first average particle size and the third average particle size.

4. The device of claim 2, wherein the ion exchange media in the first region and the second region comprise the same ion exchange media.

5. The device of claim 2, wherein the ion exchange media in the second region and the third region comprise the same ion exchange media.

6. The device of claim 2, wherein the ion exchange media in the first region and the third region comprise the same ion exchange media.

7. The device of claim 3, wherein the second average particle size is in a range of between 100 μm to 400 μm.

8. The device of claim 5, wherein the first average particle size is in a range between 500 μm to 800 μm.

9. The device of claim 3, wherein the second region of ion exchange media occupies about 50% to about 90% of the volume of the dilution compartment.

10. The device of claim 9, wherein the total volume of the first and third regions is about 10% to about 50% of a volume of the dilution compartment.

11. The device of claim 1, wherein one or more of the first, second, or third regions of ion exchange media comprises a mixture of two or more ion exchange media.

12. The device of claim 11, wherein the mixture of two or more ion exchange media comprises a mixture of at least one cation exchange resin and at least one anion exchange resin.

13. The device of claim 12, wherein the at least one cation exchange resin is a strong acid cation exchange resin.

14. The device of claim 12, wherein the at least one anion exchange resin is a strong base anion exchange resin.

15. The device of any one of claims 11-14, wherein the mixture of the at least one cation exchange resin and the at least one anion exchange resin comprises about 50% w/w of the at least one cation exchange resin.