13. The method of claim 1, wherein the multi-dentate ligand comprises an ethylenediamine tetra-acetate ion.

14. An apparatus for scaling-preventive desalination, the apparatus comprising:

a source of an aqueous composition including (a) monovalent ions selected from Na^+, K^+, Cl^-, and combinations thereof from at least one of NaCl, KCl, Na_2SO_4 and Na_2CO_3, and (b) at least one type of dissolved metal-divalent cation that can precipitate from the aqueous composition to produce scaling;

a desalination system;

a first conduit configured to feed the aqueous composition from the aqueous-composition source to the desalination system;

a source of a multi-dentate ligand;

a second conduit configured to feed the multi-dentate ligand from the multi-dentate-ligand source into the first conduit to bond the multi-dentate ligand with metal-divalent cations in the aqueous composition to form a non-scaling ionic complex;

a filtration unit coupled with the first conduit and configured to receive the aqueous composition with the non-ionic scaling complex, wherein the filtration unit includes a membrane with sub-1-µm pores sized to pass a remnant of the aqueous composition, wherein the desalination system is configured to receive the remnant of the aqueous composition from the filtration unit;

a pH-reduction apparatus coupled with a source of a pH-reducing agent and configured to separate the metal-divalent cations from the multi-dentate ligand; and

a third conduit configured to feed the non-scaling ionic complex from the filtration unit to the pH-reduction apparatus.

15. The apparatus of claim 14, wherein the second conduit is configured to feed the multi-dentate ligand from the pH-reduction apparatus into the first conduit.