CLAIMS

1. A flow battery comprising:

at least one rechargeable cell including

an anolyte compartment configured to hold a first electrolyte having a first cation species;

a catholyte compartment configured to hold a second electrolyte having a second cation species; and

an anion exchange membrane positioned between the anolyte compartment and the catholyte compartment, configured to be ionically conductive between the first electrolyte and the second electrolyte, the anion exchange membrane having a thickness of less than 100 μm and a steady state diffusivity of less than 0.4 ppm/hr/cm^2 with respect to at least one of the first cation species and the second cation species, wherein the anion exchange membrane has a thickness of less than about 55 μm, wherein the anion exchange membrane has a thickness of between about 15 μm and about 35 μm, wherein the anion exchange membrane has a thickness of about 25 μm.