

【ABSTRACT】

A membrane apparatus includes a housing, a forward osmosis membrane that divides an internal space of the housing into an inlet region and a mixing region, and a pervaporation membrane that divides the internal space of the housing into the mixing region and a discharge region. The forward osmosis membrane separates a preliminary filtration liquid from an inlet liquid which is provided in the inlet region and provides the separated preliminary filtration liquid to the mixing region, the preliminary filtration liquid is mixed with a forward osmosis draw solution in the mixing region to make a mixed solution, the pervaporation membrane separates a final filtration liquid from the mixed solution and provides the separated final filtration liquid to the discharge region, the final filtration liquid is vaporized in the discharge region to make vapor, and an amount of the vapor is adjusted by at least one of a temperature of the mixed solution and a degree of vacuum of the discharge region.