

USE OF SURFACE MODIFIED POROUS MEMBRANES FOR FLUID DISTILLATION

ABSTRACT

In some embodiments, the present disclosure pertains to systems and methods for distilling a fluid by exposing the fluid to a porous membrane that includes a surface capable of generating heat. In some embodiments, the heat generated at the surface propagates the distilling of the fluid by converting the fluid to a vapor that flows through the porous membrane and condenses to a distillate. In some embodiments, the surface capable of generating heat is associated with a photo-thermal composition that generates the heat at the surface by converting light energy from a light source to thermal energy. In some embodiments, the photo-thermal composition includes, without limitation, noble metals, semiconducting materials, dielectric materials, carbon-based materials, composite materials, nanocomposite materials, nanoparticles, hydrophilic materials, polymers, fibers, meshes, fiber meshes, hydrogels, hydrogel meshes, nanomaterials, and combinations thereof. Further embodiments pertain to methods of making the porous membranes of the present disclosure.

[Figure 1]