

Thermal desalination using a non-boiling bubble column

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ABSTRACT

An unusual property of seawater, that is its ability to inhibit air bubble coalescence, has been used as the basis for a new method of desalination. In this process water vapour can be captured, transferred and collected using a simple, continuous, fine bubble column operated at temperatures well below the boiling point. The inhibition of bubble coalescence in salt solutions facilitates the design of a bubble column with a high volume fraction of small air bubbles, continuously colliding but not coalescing. This produces a uniform, efficient exchange of water vapour into the bubbles, which can then be condensed and collected as pure water. This new method has many potential advantages over reverse osmosis and typical thermal/evaporative methods in current commercial use.

Keywords: Thermal desalination; Non-boiling desalination; Bubble coalescence; Seawater

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