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Microwave heating technology applied to sea ice desalination methods

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Desalinating sea ice to obtain freshwater is a new way to solve the water shortage. Gravitational desalination and centrifugal desalination are important methods for desalination of sea ice. Microwave heating has a significant effect on improving salt-water separation efficiency, but the effect on desalination methods is still unclear. In our research, we studied the effect of microwave power and heating time on gravitationa desalination, and four factors of the particle size of ice, initial ice temperature, relative centrifugal force and centrifugation time were selected for centrifugal desalination by microwave heating (CDBMH). For gravitational desalination combined with microwave heating, the results showed that the desalination rate of sea ice is the highest after 2–4 min, and sea ice can rapidly melt brines with higher salinities at lower microwave energies. But for centrifugal desalination, with the decrease of the particle size of ice, the increase of initial ice temperature, relative centrifugal force and centrifugation time, the desalination rate showed an upward trend, while the water yield rate and the salinity of the melted water gradually decreased. As a result of the CDBMH process, the desalination rate was 93.3%, and the water yield rate was 72.4%, and the salinity of the melted water was 0.4%.

Biography

Wei Tang is currently pursuing his Master's degree at Beijing Normal University. His research direction is in the development and utilization of sea ice resources.

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