INVESTIGATION OF AGGLOMERATES GROWTH MECHANISM FOR THERMAL SEAWATER DESALINATION

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Desalination technology has been paid large attention because water demand has been increasing due to the industrial development and high growth rate of population. To develop a novel desalination process with high energy efficiency and with high recovery ratio, a self-heat recuperative seawater desalination process using a fluidized-bed evaporator has been proposed (1). The fluidized-bed evaporator was employed to prevent scale deposition on the heat transfer surface during seawater evaporation. The seawater evaporation experiment using a lab-scale fluidized bed showed that the proposed evaporator prevents scale deposition on the heat transfer surface (2). However, it was also found that the seawater feed into the bed causes agglomeration of fluidized particles, which has the possibility to cause defluidization.

In this research, seawater evaporation experiments using the lab-scale fluidized-bed evaporator were conducted and the influence of operating conditions such as fluidizing gas velocity, seawater feed rate and bed temperature on the agglomeration behavior of fluidized particles was examined. Furthermore, the mechanism of agglomerates growth was investigated and the optimal operating conditions of the fluidized bed for thermal desalination were examined.

REFERENCES

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