Effectiveness-NTU correlation for low temperature PCM encapsulated in spheres

Abstract

The applicability of the effectiveness-NTU method for characterising a PCM thermal energy storage system was experimentally investigated. The system consisted of PCM encapsulated in spheres with a liquid heat transfer fluid. Freezing and melting tests have been carried out for a variety of conditions on a tank filled with 60 spheres. The investigation demonstrated that a correlation existed between the effectiveness of heat transfer and the mass flow rate in accordance with the effectiveness-NTU relationship for condensers and boilers. It has been proven experimentally that the effectiveness-NTU method is applicable for PCM encapsulated in spheres in a tank.