



Experimental investigation of a liquid desiccant air-conditioning system

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Abstract. The liquid desiccant air-conditioning system (LDAC) is an air conditioning system that is able to remove moisture from the air by using a liquid desiccant and cools the dehumidified air by evaporative cooling. A prototype of LDAC was built and investigated in this study. The prototype mainly consists of a dehumidification unit (DU) and a dew-point evaporative cooler (DPEC). Two types of DU which are a single-stage DU and multi-stage DU were tested. Four different configurations of the DPEC and DU were examined to find the one that can supply a proper conditioned air for a tested room in Thailand where the weather is hot and humid. According to the tests, it was found that Configuration 3 has the highest wet-bulb effectiveness of 1.4 and COP of 1.46, and can reduce the air temperature from 41 °C to 23 °C.

Keywords: Dew-point evaporative cooler; Air conditioning system; Liquid desiccant; Dehumidification unit; Potassium formate.