

ABSTRACT

A desiccant dehumidifier regenerated by hot and cold water heater system has been installed and experiments were carried in a hot and humid climate (Thailand). A Desiccant coated on a heat exchanger system can handle latent and sensible loads by removing the moisture by an adsorption process when supplying cold water from a chiller and desorption by supplying hot water from a heater. Influence of operation parameters including air inlet temperature, air inlet humidity, cycle time, inlet air velocity, and water flow rate on system. Performance are analyzed in term of moisture adsorption (D_{ad}), moisture desorption (D_{de}), thermal coefficient of performance (COP_{th}), moisture removal capacity (MRC), Moisture removal regeneration (MRR), Dehumidification effectiveness (E_{deh}) and regeneration effectiveness (E_{reg}). The system could reduce the temperature of the delivered air by about 8°C while the humidity ratio was reduce by 0.005 kg_w/kg_{da} equivalent to 20% relative humidity reduction.

Keywords: Desiccant dehumidifier, Dehumidification, Air dehumidifier