

硅胶-水吸附式制冷机组变热源下制冷性能 Refrigeration Performance of a Silica Gel-Water Adsorption Chiller Driven by Variable Heat Source

孔祥强 王如竹 李瑛

山东科技大学

关键词: 吸附式制冷 低温储粮 变热源 动态特性

摘要: 根据吸附式制冷在使用过程中存在的变热源问题,对燃气内燃机余热驱动的吸附式制冷机组进行了实验研究。机组采用硅胶-水作为吸附工质对,由2个解吸/吸附真空腔和1个蒸发器热管工作腔组成。实验结果表明,变热源温度65℃时吸附式制冷机组的制冷功率能够达到变热源温度90℃时的63%,制冷系数变化较小。机组瞬时制冷性能具有很好的可重复性和稳定性。证实了吸附式制冷机组变热源运行时可靠性高,低温性能良好。将吸附式制冷与太阳能热利用、余热回收利用相结合,用于粮食低温储藏的技术途径是可行的。Due to the variable heat source problem for an adsorption cooling system in the practice, a silica gel-water adsorption chiller was experimentally studied, which was driven by recovered heat from gas engine. The chiller consisted of two desorption/adsorption chambers and one heat-pipe working chamber of evaporator. The experimental results show that the cooling power with the 65℃ variable hot water temperature attains 63% of one under 90℃, and the COP (coefficient of performance) of the chiller has a small change which may be ignored. The transient refrigeration performance of the chiller has the good repeatability and stability. It was proved that the chiller driven by variable heat source is very reliable and good for low-grade heat source. This technology approach is feasible to be used for low temperature grain storage with combination of adsorption cooling and solar thermal or waste heat utilization.

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