

Experimental study of solar refrigerator system using activated alumina and methanol adsorption pair

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Abstrak

This study investigates the performance of a solar adsorption refrigerator using activated alumina and methanol adsorption pair. The experiments were carried out for 24-hour. The refrigeration was completed during seven cycles with varying weather conditions. A flat plate type collector was used with an area of 0.25 m² and tilt angle of 30°. Theoretical calculations show that, the maximum collector efficiency is 47.15% when the maximum solar radiation obtained is 936.9 W/m². In this research, the maximum value of the COP is 0.0991 when the total solar energy is 16.485 MJ/m² and the minimum value obtained is 0.0919 when the total solar energy is 7.609 MJ/m². The experiment results show that the adsorption pair system can deliver an evaporator temperature of about 9.92°C and the cooling load can be achieved by a heat source with a temperature range of 83.95°C and 95.39°C.