سیویلیکا - ناشر تخصصی مقالات کنفرانس ها و ژورنال ها
گواهی ثبت مقاله در سیویلیکا
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عنوان مقاله:

INVESTIGATION OF USING SATURATED SOLAR POND TO PRODUCE INDUSTRIAL WATER FROM SEA WATER

محل انتشار:

دهمین کنگره ملی مهندسی شیمی ایران (سال: 1384)

تعداد صفحات اصل مقاله: 8

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خلاصه مقاله:

In this study, the energy obtained from a saturated solar pond (SSP) is used as the required input heat for a four stage flash distillation apparatus to treat sea water and produce industrial water. The best water treatment system to combine with (SSP) is multi stage flash distillation (MSF), because the temperature required in this system is around 80-90ºC which is attainable from saturated solar pond. Dimensions of (SSP) are an important factor, because the rate of heat extraction from these ponds depends on the height and the surface area of the pond. In this study, according to our design 0.15 MJ per day energy had to be extracted from the pond. A computer model was constructed and the height of pond was found to be 0.3 m and its area found to be 0.5 m2. The pond was constructed with glass. MgCl2 and KNO3 were chosen as salts to saturate the pond. Experimental data shows that KNO3 is a better choice than MgCl2 because KNO3 has more effect on increasing the temperature of lower convective zone of the pond and therefore increases the deliverability of the energy from the pond. Finally, mass and energy balances on the upper convective zone, nonconvective zone and lower convective zone of the (SSP) were written to yield a set of partial differential equations. These equations were solved numerically to predict thermal performance of the pond over a long period of time. Lower convective zone temperature reached about 65ºC and the daily temperature variation was about 11ºC. It should be noted that due to the small size of the model the rate of heat losses from the edges of the pond cause the attained temperature (ie,65ºC) to be lower than the real situation where heat losses from the edges .are not important and therefore the attained temperature will be higher than 65ºC

کلمات کلیدی:

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