

تصميم وجناء سخان شمسي و تقييم أداءه

تحت الظروف الجوية المختلفة لمدينة

البصرة - العراق

ج. احمد جاسم محمد

مركز ابحاث البوليمر / قسم علوم المواد

جامعة البصرة

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**Designing and Manufacturing a solar heater
and evaluating its performance under different
atmospheric circumstances of
Basra city.Iraq**

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Polymer Research Centre /Basra Universit

Abstract

In this research a solar water heater has been constructed and its performance has been evaluated under different atmospheric circumstances of Basra city. This region is well known of its plentiful of solar radiation. The solar heater has consists from the Copper tubes and the total area of (0.45 m²). Several additions have been made and examined in order to increase the performance of the solar heater, we found this experimental study that the efficiency without any improvement is (41%), and increase to (48.5%) by using glass tubes for the solar heater, and increase to (59.5%) by using external light reflector for the glass tubes.

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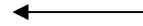


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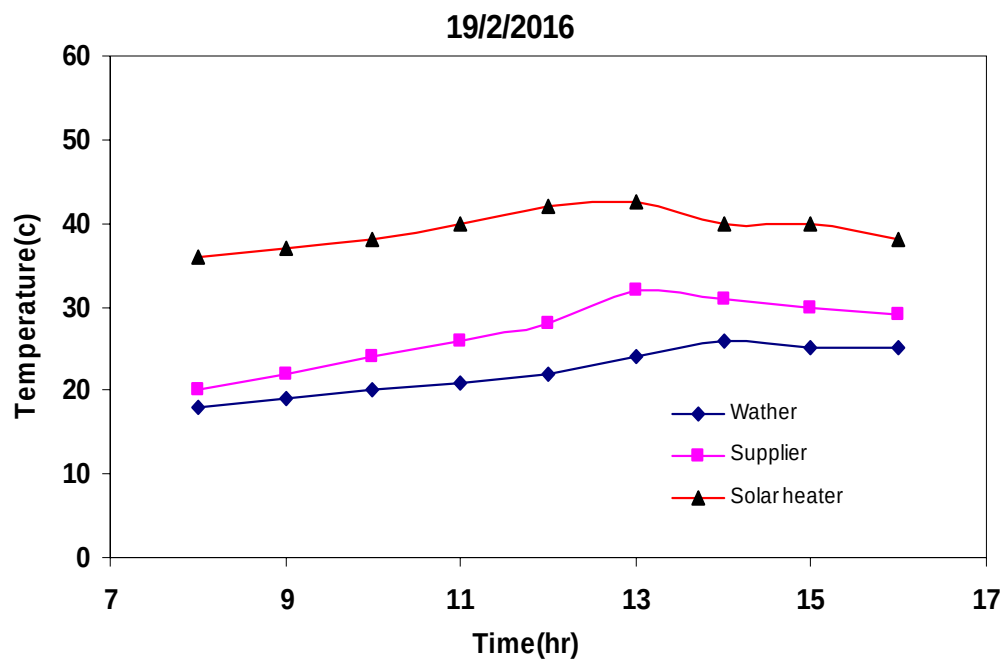
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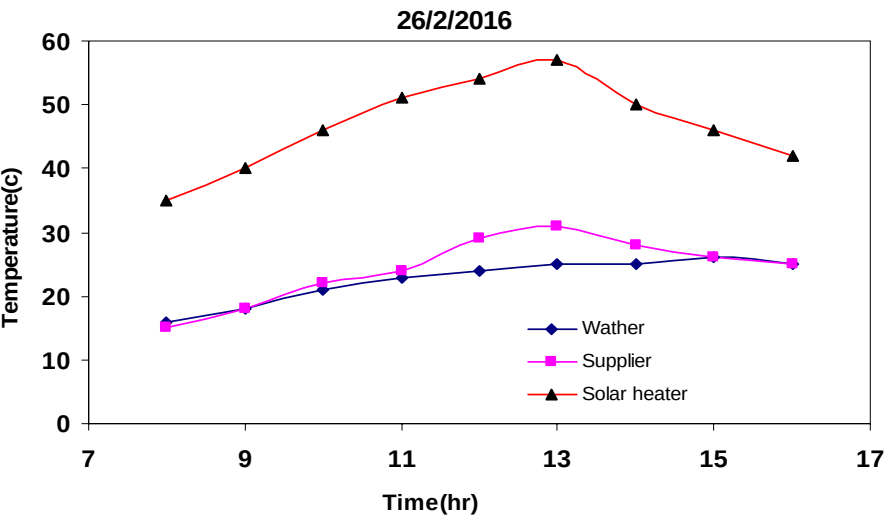
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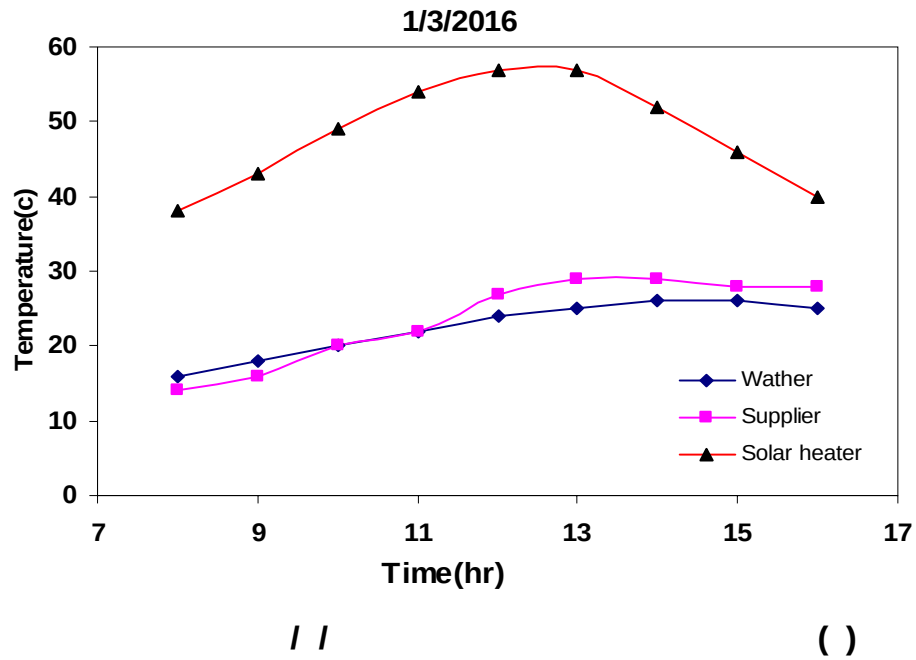
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$$Q_u = \rho C (T_{av} - T_i) \dots \dots \dots (1)$$

: ρ .(W) : Q_u
: T_i .(C⁰) : T_{av}
: C .(kJ/kg.C⁰)

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$$Q_{abs} = I_b \cdot A_p \cdot F_t \cdot (\tau_g a_p) \dots \dots \dots (2)$$

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.(W) : Q_{abs}

.(W/m²) : I_b

.(m²) : A_p

· : F_t

: F_{sh}

: F_d

: (τ_gα_p)

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.[14] α_p= 0.97 , τ_g= 0.95 , F_{sh}= 0.98 , F_d= 0.97 , F_t= F_d.F_{sh}

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Q_{u(acu)} = MC (T_{av} – T_i) / t(3)

.(Sec) : t .(kg) : M

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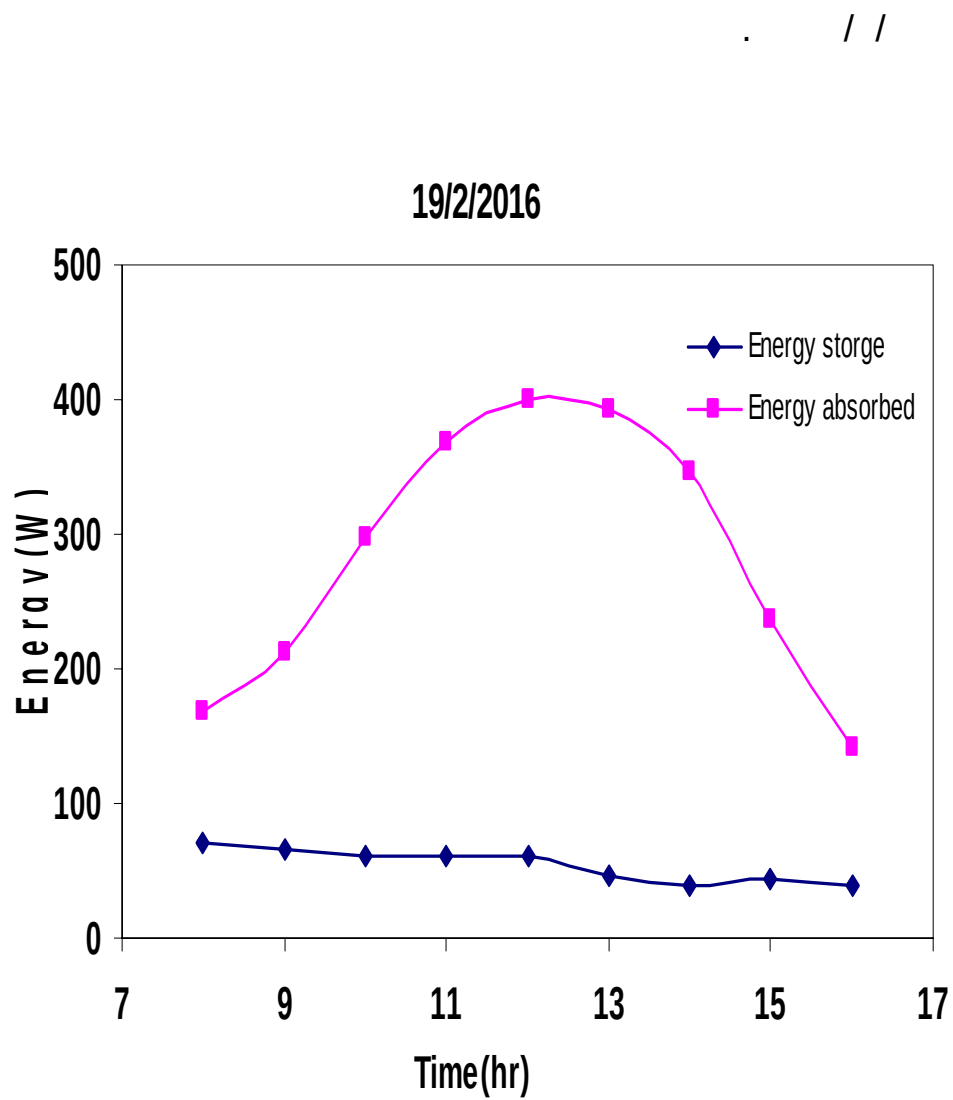
η_s = Q_{u(acu)} / Q_{abs} (4)

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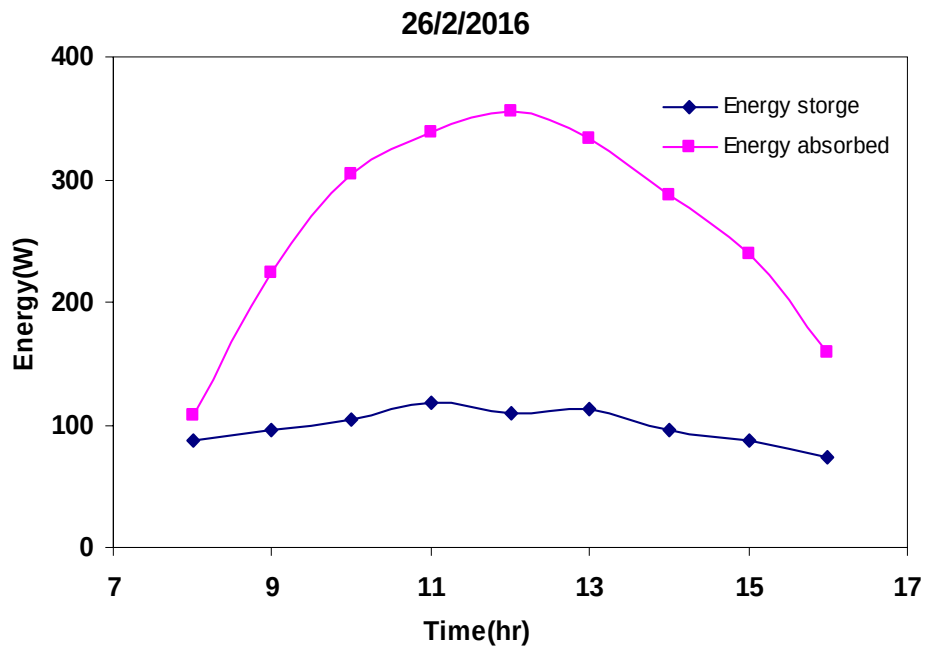
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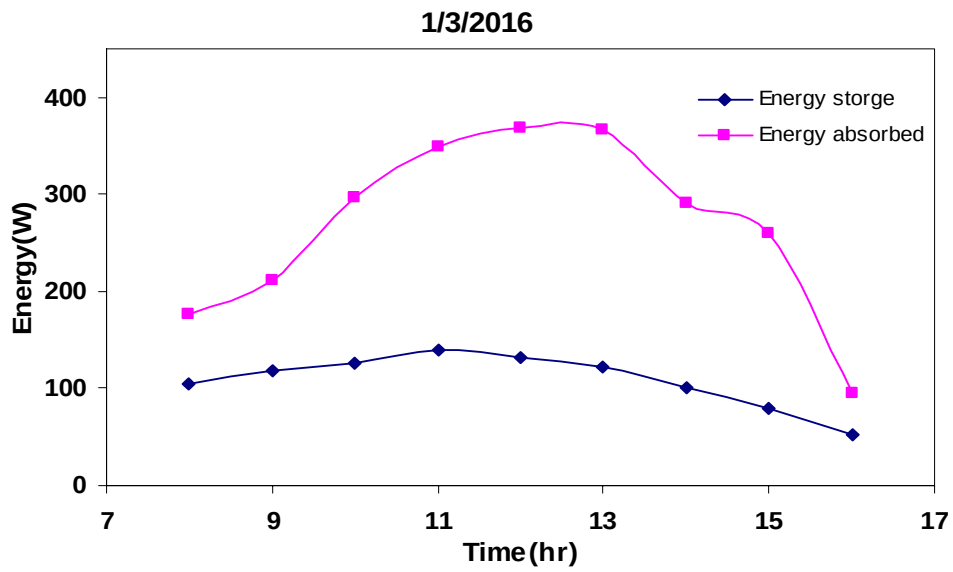
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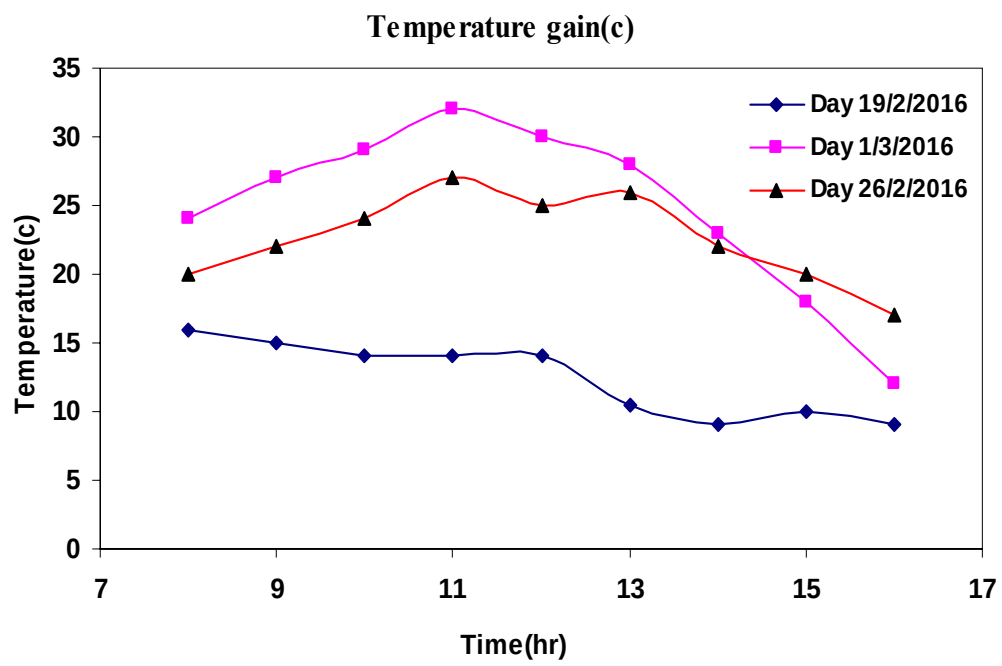
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	C °	C°	W	MJ/m ³	W/m ²
:	14	38	176.17	104.88	
:	16	43	211.80	.	
:	20	49	297.14	.	
:	22	54	348.82	.	
:	27	57	368.25	.	.
:	29	57	367.52	.	.
:	29	52	291.62	.	
:	28	46	260.15	.	.
:	28	40	94.65	.	

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(32 C°)

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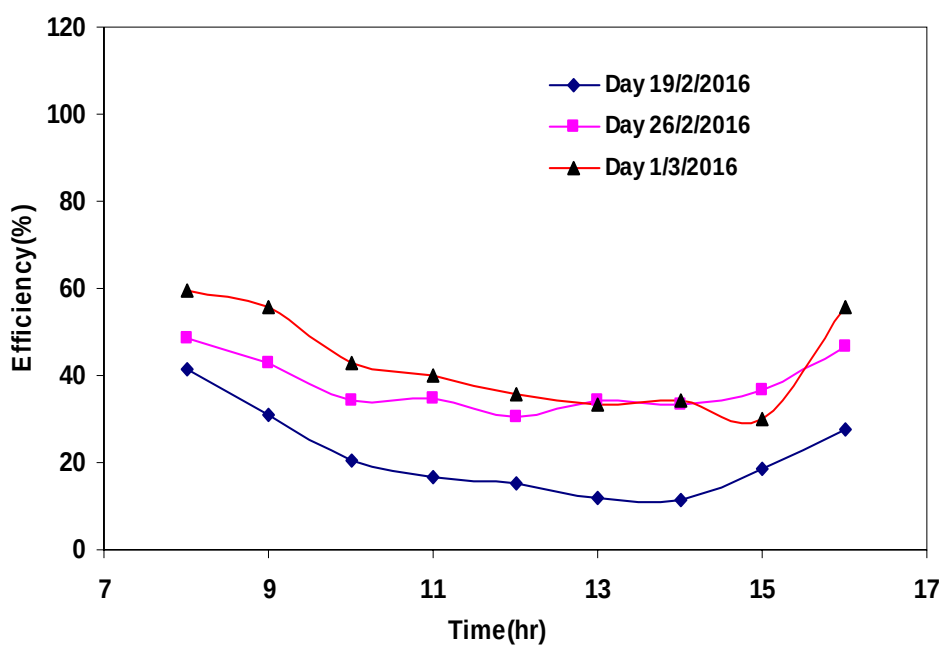
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