

Number of scholarly publications on sustainability published.

No	Title	Authors' name(s)	Journal's name	Scopus
2020				
1	High performance thermal coating comprising (CuO:NiO) nanocomposite/c spectrally selective to absorb solar energy	Abed, R.N. Abed,A.R.N. Khamas, F.A Abdallh, M. Yousif, E.	Progress in Color,Colorants and Coatings 13(4), pp. 275-284	Yes
2	Synthesis, characterization and environmental remediation applications of polyoxometalatesbased magnetic zinc oxide nanocomposites (Fe ₃ O ₄ @ZnO/PMOs)	Ammar, S.H. Abdulnabi, W.A. kader, H.D.A.	Environmental Nanotechnology, Monitoring and Management	Yes
3	The effect of low rise residential buildings design formation on energy performance (Iraq hot desert climate as an example)	Hassan, S.A.	Test engineering and management	Yes
4	Spectrally selective coating of nanoparticles (Co O :Cr O) incorporated in carbon to captivate solar energy	Abed, R.N. Abdallh, M. Adnan Rashad, A. Al- Mohammedawi, H.C. Yousif, E.	Heat Transfer - Asian Research	Yes

5	Design of wind catcher for earth air heat exchangers to rationalize energy consumption	Jassim, J.A.A.W. Hassan, S.A. Maula, B.H	Journal of Advanced Research in Fluid Mechanics and Thermal Sciences 65(2), pp. 286-294	Yes
2019				
1	Electrocoagulation technique for refinery wastewater treatment in an internal loop split-plate airlift reactor	Ammar, S.H. Ismail, N.N. Ali, A.D. Abbas, W.M.	Journal of Environmental Chemical Engineering 7(6),103489	Yes
2	Using Treated sewage water for irrigation to Reduce Environmental Pollution	Al-Hadithy, A.H. Gh Al-Qaysi, W. Hashim, L.Q.	Journal of Physics: Conference Series 1294(5),052065	Yes
3	Impact of stabilizer on the environmental behavior of PVC films reinforced 1,2,4-triazole moiety	Yousif, E. Ahmed, D.S. Ahmed, A. Yusop, R.M. Mohammed, S.A.	Environmental Science and Pollution Research 26(25), pp. 26381- 26388	Yes
4	Induction motor rotor: Energy efficiency improvement on economic and environment	Rahmat, M.K. Yahya, Y.B. Suffer, K.H	AIP Conference Proceedings 2129,020052	Yes

5	Biodiesel from fresh and waste sunflower oil using calcium oxide catalyst synthesized from local limestone	Qasim, D. Abdul- Aziz, Y.I. Alismaeel, Z.T.	Research Journal of Chemistry and Environment 23(Special Issue I), pp. 111-119	Yes
6	The role of multi-story structural building systems on reducing embodied energy consumption and carbon emissions	Hassan, S.A. Al Wahid Jassim, J.A.	IOP Conference Series: Materials Science and Engineering 518(2),022031	Yes
7	Biom mineralization based remediation of cadmium and nickel contaminated wastewater by ureolytic bacteria isolated from barn horses	Khadim, H.J. Ammar, S.H. Ebrahim, S.E.	Environmental Technology and Innovation 14,100315	Yes
8	The effect of high UV radiation exposure environment on the novel PVC polymers	Yousif, E. Ahmed, D.S. Ahmed, A.A. Amamer Redwan Mohammed, S.A.	Environmental Science and Pollution Research 26(10), pp. 9945- 9954	Yes

9	Regional cooperation of states on the issue of protection of the world ocean ecosystems from pollution	Valiullina, K.B. Hashim, S.J. Kurdyukov, G.I.	Journal of Environmental Treatment Techniques 7(Special Issue), pp. 966-969	Yes
2018				
1	Cultivation of Nannochloropsis oculata and Isochrysis galbana microalgae in produced water for bioremediation and biomass production	Ammar, S.H. Khadim, H.J. Mohamed, A.I.	Environmental Technology and Innovation 10, pp. 132-142	Yes
2	Optimizing solar energy for houses with slanting type roofs	Salim, M.S.	International Journal of Engineering and Technology(UAE) 7(2), pp. 913-916	Yes
3	The Role of Environment and Biodiversity in Sustainable Development	ا.م.د. وفاء غازي فاضل	مجلة الهندسة والتكنولوجيا	مجلة محلية
4	Design and Implementation of a Telemetry System for Environmental Applications	ا.د. جابر سلمان عزيز	Al-Khwarizmi Engineering Journal	مجلة محلية
5	Produce an Analytical Map for the Distribution of Air Pollution by Toxic Gases in Baghdad City by Geographic Information System	م.م. وسن عبد الله حسن	مجلة النهرين للعلوم	مجلة محلية



Optimizing solar energy for houses with slanting type roofs

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Abstract

During the daily sun cycle, the falling rays are of varying intensity on the solar panel reducing the energy generated from it. This is evident in the energy production of solar panels that are installed on the slanted surfaces of houses scattered in the rural regions of the world. In this research, the reasons for the low efficiency of energy production of solar panels that are installed on the A-frame designs of houses were studied and solved. The design of an integrated tracking system is developed based on fuzzy logic control using an open source code that can be easily modified. The performance and characteristics of the solar tracking device are tested experimentally to test its suitability for use with slanted roof houses. The integrated solar localization system offers economical and efficient solar monitoring, as well as open source programming, which allows for future improvements and changes. In addition, the single-axis fuzzy tracking system was good for moving both panels in less than five seconds towards the sun. The adoption of the proposed design provides an extremely accurate tracking system and therefore, maximizes the potential of power generated by the solar panel since it will meet the sun's rays from dawn to dusk. The economic effect of the proposed design is to approximately double the value of electrical power received compared to the fixed design.

Keywords: Renewable Energy; Fuzzy Logic Control; Embedded Systems; Solar Tracker; Slanting Solar Panels.

where the angle is vertical between the falling sun and the solar panel using active or passive control system. In this research, design a fuzzy controller system to control the slanting direction of the co

1. Introduction



The Effect of Low Rise Residential Buildings Design Formation on Energy Performance (Iraq Hot Desert Climate as an Example)

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Abstract
 Residential buildings design formation varies according to the environmental, constructional and functional requirements. The environmental aspect is the most significant requirements that connect with energy performance. Last decades considerable attentions were made about the energy consumption for residential buildings. Previous studies showed that total energy consumption for residential building reached to 40% from the total energy consumption. This research problem is that no obvious recent research about the effect of the low rise residential buildings design formation as a prototype of residential buildings in Iraq on reducing energy consumption. In this study several options for low rise residential buildings design formation were selected for the assessment of energy consumption. Software simulations were used to estimate the energy performance model for different residential buildings design formation. Results demonstrate that contiguity of residential buildings had better results in energy consumption reached to 48% as compared to buildings with no contiguity. Also buildings with north orientation reduce energy to 14% as compared to

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High performance Thermal Coating Comprising (CuO:NiO) Nanocomposite C Spectrally Selective to Absorb Solar Energy

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ABSTRACT

A novel nanocomposite consisted of nanomaterials as (CuO:NiO) and carbon (fuel ash) were designed to absorb solar energy. Thin films were made via coating and spin coating of the dopants nanocomposite thin films, containing different concentration ratios of CuO:NiO. These thin films are precipitated on a glass and copper substrates. The optical properties of the doped fuel ash film with nanoparticles were measured in the range of 250-1300 nm. The intensity of solar radiation was measured too. The data were analyzed and interpreted in terms of the theory of phonon-assisted direct electronic transitions. The E_g of the doped C was measured with different concentration ratios of (CuO:NiO) (A=0.3:2.2, B=1:2, C=1:1:1, D=2:1, E=1:0.5:0.5) wt. %, with a fixed concentration of C of (7) wt.%. The results of the doped samples revealed an energy gap of (2.3-3.9 eV) and the absorptivity ranged from (85-99 %) for all nanocomposites. The energy gap of this nanocomposite system is very suitable to those of semiconductors and has high efficiency to absorb the solar

Biodiesel from fresh and waste sunflower oil using calcium oxide catalyst synthesized from local limestone

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Abstract
 A study of converting fresh and waste sunflower oil to biodiesel through transesterification reaction using heterogeneous catalysts is established. Calcium Oxide (CaO) was selected as a basic heterogeneous catalyst because it is the cheapest and the most available comparing with other options. The characteristics of the catalyst were evaluated using several evaluation tests. The results confirm that the best preparation condition is at 850°C and 2 hours. This catalyst has demonstrated positive results, high productivity and good recycling potential. The best conditions for reaction were obtained by varying the reaction conditions to obtain the highest bio-fuel production. The reaction has been studied in various operating conditions of methanol to oil molar ratio, catalyst loading, agitation speed and reaction time at temperature 65°C. The maximum yield of biodiesel was 97.4% for fresh vegetable oil.

Moreover, the catalyst shows perfect results for transesterification of waste vegetable oil. It was tested for market waste sunflower oil and home waste

glycerin through a transesterification reaction which is a reversible catalytic reaction¹.

Catalysts are usually utilized in the production of biodiesel to increase yield and the rate of reaction². Three various kinds of catalysts can be used in the transesterification process for biodiesel synthesis: base catalysts, acid catalysts and biocatalyst³.

However, although several basic catalysts have shown promising activities like basic zeolites⁴, alkali and alkali earth oxides^{11,12}, alkali and alkali earth carbonates¹³, supported guanidines¹⁴ and basic hydroxides^{15,16}. Among the alkali and alkali earth oxides, CaO is one of the solids that has displayed higher transesterification activity¹⁷⁻¹⁹. The process of transesterification using CaO as a solid base catalyst has many features such as mild reaction conditions, higher activity, low cost and catalyst reusability²⁰. CaO has excellent catalytic features such as acceptance of high free fatty acid and high basic strength, less environmental risk effect due to its low solubility in alcohol^{21,22}.

CaO as a heterogeneous catalyst can be achieved from several sources such as chicken eggshell, limestone,