

TiO₂/Jackfruit peel using solar distiller by use of energy storage

S.Aasha

Research Centre for Solar Energy, Department of Engineering Physics, College of Engineering, Koneru Lakshmaiah Education Foundation, Green Fields, Vaddeswaram, Guntur 522502, Andhra Pradesh, India. s.shanmugam1982@gmail.com

Abstract

Jackfruit peel synthesized by greener via blended with TiO₂ nanoparticles. They verified with a variety of concentrations with & without coating of the distiller. Researchers fabricated the experimental setup analysis with the different parameters. Characterization results shows the functional energy additives; surface morphology; structure of chemicals. Its shows the potential values is 19.3 mV and crystalline is 85% 85% FTIR spectroscopy explains the bands of absorptions. Distillate yields of 4.96 L/m² & 6.12 L/m² efficiency achieved 102.64%.

Introduction

Ghandourah et. al [1] established a double slope distiller coated with lanthanum cobalt oxide and analyzed various water discharge rates (0.050 kg/min, 0.10 kg/min and 0.20 kg/min). The results revealed that 20 wt% lanthanum cobalt oxide with black paint achieved a daily protectivity is 5.40 kg/m².day compared to without coating is 3.85 kg/m².day. Sahota et al. [2] implemented a dual slope solar distiller used with various nanofluids. The model produced thermal performance analysis of energy, exergy, enviroeconomics. The system uses Al₂O₃, Tio₂, and CuO nanofluids. The nanofluid based on 19.10%, 10.38% and 5.25% used Al₂O₃, Tio₂, and CuO with the production of the system. Exergy analysis of the system is 37.77% (Al₂O₃), 25.55% (Tio₂), and 11.99% (CuO). The environmental parameters are i=4%,8%, and 10% for the different interest rates of economics.The effect of nanofluid was constructed by Sahota and Tiwari [3], producing a dual slope solar distiller with compared studies of Al₂O₃, Tio₂, and CuO. The optimized analysis of 0.25% of metalnanoparticlesicle. The yield is Al₂O₃ (50.34%), Tio₂ (46.10%), and CuO (43.81%) compared to achieving 37.78% with base fluid.The performance of the nanofluid by the system was Al₂O₃ (14.10%), Tio₂ (12.38%), CuO (9.75%) then compared basefluid of (4.92%). Piyush Pal et al.[4] have modified multiwick DSSS and analysis of enviroeconomic with energy matrix. Therefore constructions

of EPBT, LCCE, EPF, energy and exergy economic analysis of Jute and Black cotton wicks produced Co₂ emission per annum about 7.82 and 8.69 tons as energy, exergy analyzed of 0.155 and 0.198 tons based on 1 cm water depth with the performance of the design. It concluded that of exergyeconomic with parameters performed around 0.0623 and 0.0791 kWh/Rs with analyzed materials than 50 year lifetime of the system interest rate of 4%. Alireza et al [5] analyzed the energy and exergy of a solar energy based Rankine cycle. Results explained that the heat source achieved 65% of exergy destruction.



Fig-1. Shown Fresh Jackfruits KLEF

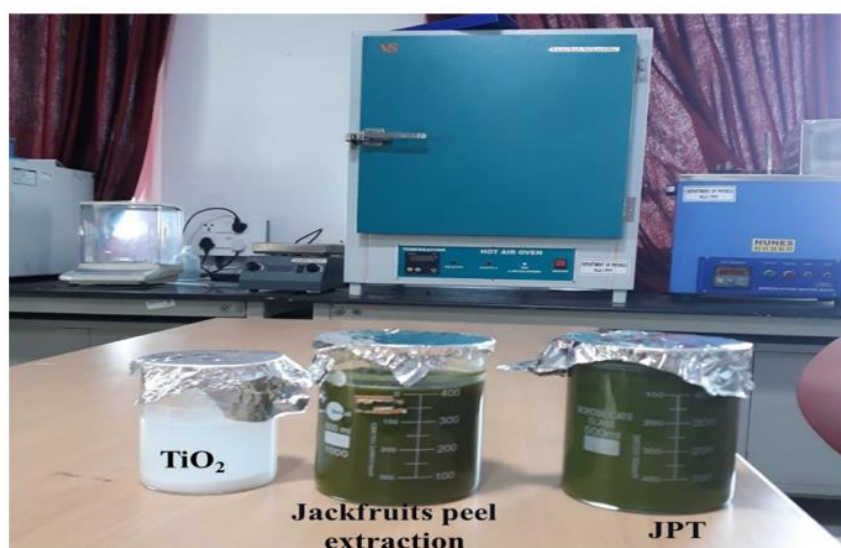
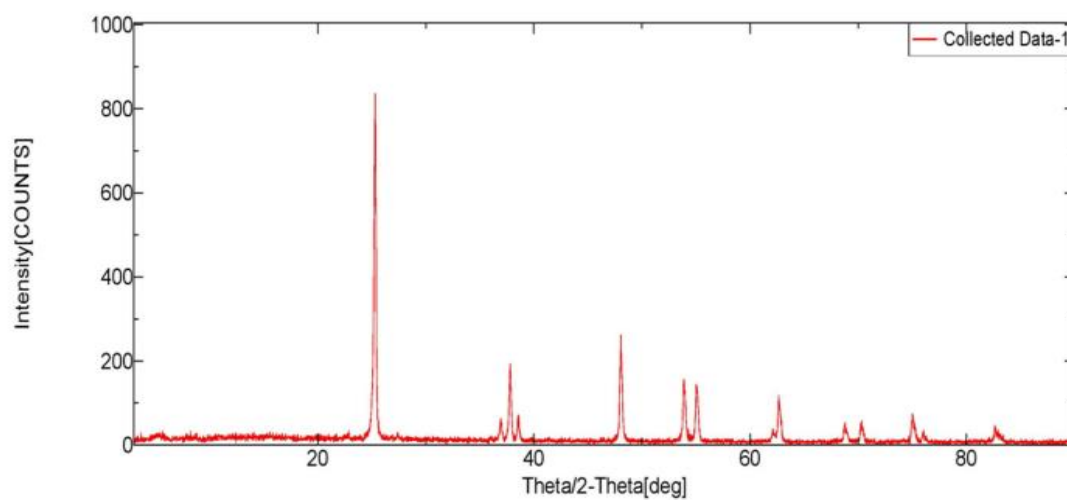
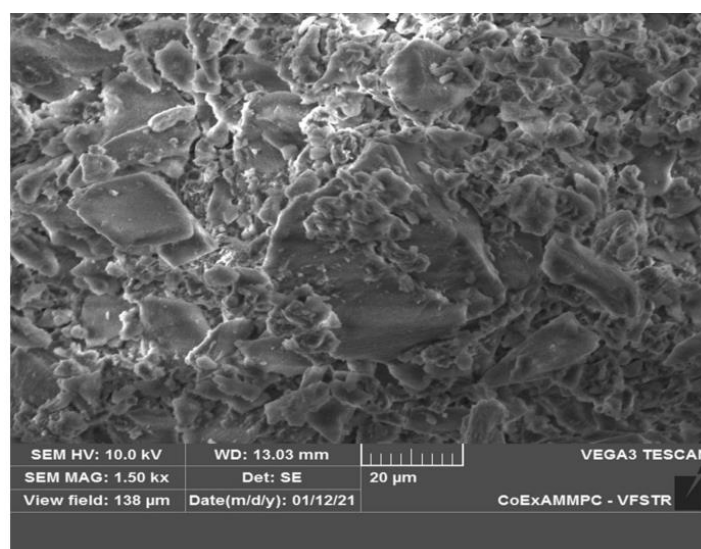


Fig-2. Synthesis Process**Fig-3. XRD performance****Fig-4 SEM analysis**

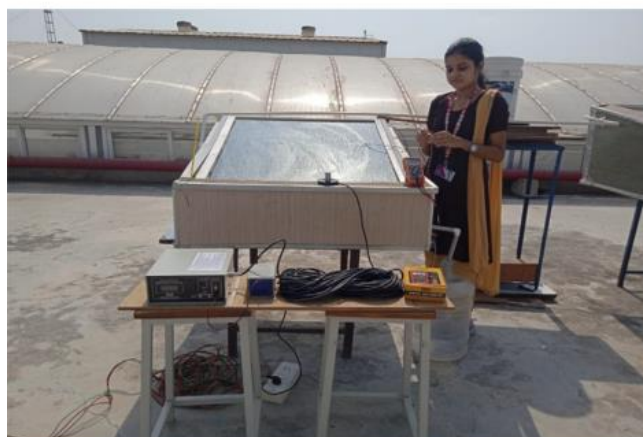


Fig - 5. Experimental testing solar still,

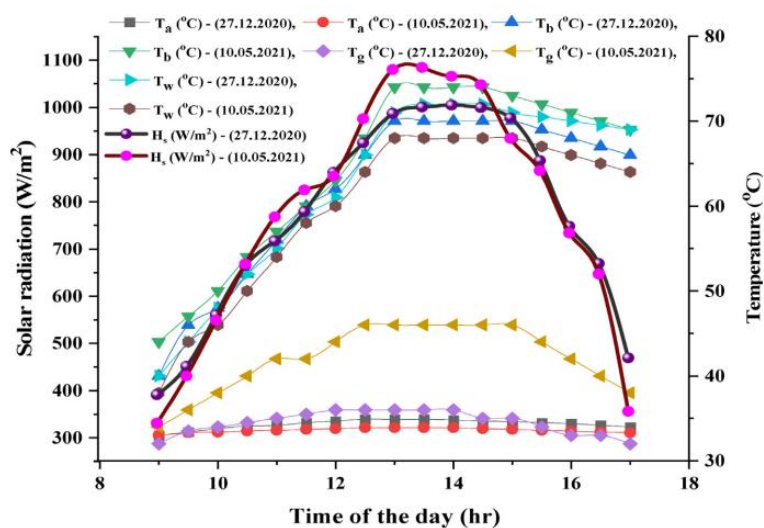


Fig- 6. Temperatures analysis

Conclusion

Renewable energy source of jackfruit peels are good source of materials for absorption of solar beams. Author introduced the novel work of greener synthesis of JPT. They analyzed the experimental setup and verified with the time period of 10,05.2021 and 27.12. 2020. The solar distiller increased the productivity upto 8.7919 L/m^2 per day and efficiency upto 57.86%. Optical absorption wavelength is 57.86% and TEM shows 42–65 nm.

Reference

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