

Drying of Agro-Industrial Wastes Using an Indirect Solar Dryer

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Abstract : The Agro-industry is considered as one of the most waste producing industrial fields as a result of food processing. Upgrading and reuse of these wastes as animal or poultry food seems to be a promising alternative. Combined with the use of clean energy resources, the recovery process would contribute more to the environment protection. It is in this framework that a new solar dryer has been designed in the Unit of Solar Equipments Development. Indirect solar drying has, also, many advantages compared to natural sun drying. In fact, the first does not cause product degradation as it is protected by the drying chamber from direct sun, insects and exterior environment. The aim of this work is to study the drying kinetics of waste, generated during the processing of orange to make fruit juice, by using an indirect forced convection solar dryer at 50 °C and 60 °C, the rate of moisture removal from the product to be dried has been found to be directly related to temperature, humidity and flow rate. The characterization of these parameters has allowed the determination of the appropriate drying time for this product namely orange waste.

Keywords : solar energy, solar dryer, energy conversion, orange drying, forced convection solar dryer

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