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Mathematical modelling of the drying kinetics of jatropha curcas l. Seeds collected from ethiopia

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Jatropha (*Jatropha curcas* L.) seeds contain non-edible oil and have been considered as a promising biodiesel feedstock. The present research emphasized on the drying kinetics of jatropha seeds at storage moisture content and the mathematical modelling of the drying process. The non- pretreated seeds (whole seeds) and pretreated seeds (crushed seeds) were dried at five different air temperatures (313, 323, 333, 343 and 353K) in a standard heating furnace. The moisture loss from the seed samples was systematically recorded, converted to unit less moisture ratio and adjusted to four frequently used semi-theoretical mathematical models: Lewis model, Henderson and Pabis model, Page model and Avhad and Marchetti model. The fitness of the models to the experimental data were compared using the coefficient of determination, chi-square test, root mean square error, mean bias error and mean absolute error. It was found that the increase in the air temperature caused a reduction in the drying time of both the whole and crushed seeds. From the four mathematical models, Avhad and Marchetti model was found to be the most suitable to represent the drying kinetics of jatropha seeds at the storage moisture content.

Biography

Y G Keneni has completed his MSc from Addis Ababa University, Faculty of Science, Ethiopia. He is the Academic Staff of Hawassa University and doing his PhD at the Norwegian University of Life Sciences, Faculty of Science and Technology, in the area of Biodiesel. He is working on jatropha (*Jatropha curcas* L.) seed drying processes, mathematical modeling of the drying kinetics, extraction of oil from jatropha seeds by different solvents as well as simultaneous transesterification reactions of the oil in the presence of heterogonous catalysts to produce biodiesel.

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