Smart Innovation, Systems and Technologies 169

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Intelligent Manufacturing and Energy Sustainability

Proceedings of ICIMES 2019

KES International

Springer

Smart Innovation, Systems and Technologies

Volume 169

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ISSN 2190-3018 ISSN 2190-3026 (electronic)
Smart Innovation, Systems and Technologies
ISBN 978-981-15-1615-3 ISBN 978-981-15-1616-0 (eBook)
https://doi.org/10.1007/978-981-15-1616-0

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The registered company address is: 152 Beach Road, #21-01/04 Gateway East, Singapore 189721, Singapore

Effect of Drying Temperature to the Thin Layer Drying Model of Sago Starch

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Abstract The demand on sago starch in industrial application is continuously growing, but the research on its drying behavior is still limited. In this study, ten thin layer drying models were compared through four drying temperatures in order to find the best model to describe the drying characteristic of sago starch. According to the results, sago starch exhibits drying during the falling rate period. The moisture diffusivities ranged from 8.56×10^{-10} to 1.39×10^{-9} m^2/s that varied through drying temperature while the activation energy was 16.18 kJ/mol. Based on the study, the drying pattern was best described by the Page model.

1 Introduction

Sago starch has been commercialized globally; however, some of local farmers and small stakeholders still produce sago starch traditionally for local market and domestic purpose [1]. Despite having a good demand among local people, traditional sago starch is facing quality issue regarding the high amount of moisture content [2]. In spite of out from the quality standard, high moisture content may cause another problem such as high risk of microbial growth [3], high mass, transportation difficulty and short shelf-life [4].

Moisture content is the amount of water molecule attached with particular material. In starch, bound water had already attach to starch molecules since in the palm state (before harvesting), while free water was obtained during extraction process [5]. Both types should be removed through drying process in order to reduce the amount of moisture content. However, it should be noted that different moisture content has different effect on starch properties; therefore, the moisture removal process should consider the demand or preference regarding the starch application [6, 7].

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A. N. R. Reddy et al. (eds.), *Intelligent Manufacturing and Energy Sustainability*,
Smart Innovation, Systems and Technologies 169,
https://doi.org/10.1007/978-981-15-1616-0_56