STUDY ON EFFECT OF TEMPERATURE ON DENSITY AND RHEOLOGICAL PROPERTIES OF CRUDE PALM OIL

Renny Permatasari, Sugiyono, and Nur Wulandari
Department of Food Science and Technology, Faculty of Agricultural Engineering and Technology, Bogor Agricultural University, IPB Darmaga Campus, PO Box 220, Bogor, West Java, Indonesia.
Phone 62 251 8624622, e-mail: rennypermatasari@rocketmail.com

ABSTRACT

Indonesia is the largest CPO producer in the world. Production of CPO in Indonesia increases in each year. Increasing of CPO production must be balanced with the development of its transportation systems. One of the efficient transportation system of CPO is pipeline transportation. On this pipeline transportation, density and rheology is a crucial parameter for pipeline design calculation and simulation of its momentum transfer process and system. The aim of this research was to get data of the density and rheological properties of CPO on different temperature. The samples used in this research were obtained from four different factories of palm oil in Indonesia. The density was measured by AOCS 1997 method and the rheological properties of CPO was measured by Haake Rotoviscometer RV20 (Karlsruhe, Germany). The results showed that the temperature influenced on density and rheological properties of CPO. Density decreased with increasing of temperature. The flow behavior index (n) increased with increasing temperature but the consistency index (K) and apparent viscosity of CPO decreased with increasing of temperature. Generally, CPO exhibited a pseudoplastic behavior at temperature of 25-40°C and a Newtonian behavior at temperature of 45-55°C.

Keyword: crude palm oil, pipeline transportation, temperature, density, rheology