

Generalized method of estimating vegetable oil properties with special reference to palm oil using VEGEPRO

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Malaysia has to be in the leading edge in terms of technology in order to remain competent in the palm oil industry. In engineering design of palm oil processes, most of the time the experimental data of the desired substance is not available. As a result, the palm oil industry is facing a lot of processing problems and more often than not short term solution is seek through ways of improving the efficiency of the various unit operations. In this aspect, the palm oil industry is rather backward. This is in contrast to the long established petroleum industry which has sophisticated built-in physical property databases in their design and simulation software. Therefore, in designing of palm oil processes, the designer has to resort to other means in obtaining properties. This is where estimation methods are handy.

Realising the weaknesses faced in the palm oil industry, a software VEGEPRO for the estimation of physical properties of vegetable oil is written using Visual 6. The physical properties that can be estimated are, density, viscosity, specific heat capacity and vapor pressure. There are three main steps involved in developing VEGEPRO. The first is to experimentally measure the properties if it is not available. Secondly, the properties has to be correlated and estimations of mixture from pure components developed. Most of the correlations developed are based on the experimental properties measured earlier in this work. The final step is to convert the findings into a physical property database software. This paper shall focus on discussing the generalised methods used in estimating the properties and the accuracy of the methods when applied to various types of vegetable oil.

The novel features of this software includes its ability to be extended to estimate the physical properties of other pure components and other vegetable oil mixtures apart from palm oil with reasonable accuracy provided their triacylglycerol and fatty acid composition is known. This capability is included in a built in user option.

The knowledge of these properties is crucial in developing new process design, new product and optimization of the industry. With the advent of this software, valuable research time can be considerably reduced in establishing the required properties prior to product and process development. It is hoped that VEGEPRO would serve as a first step in further development of other simulation packages in the vegetable oil industry.