

Abstract

Red fruit (*Pandanus conoideus* Lam.) contains high amounts of carotenoid which contributes to its distinct red color that makes it a suitable source of natural colorant. Encapsulation through co-crystallization is conducted to increase applicability of red fruit oil. The research aims to assess the effect of different storage temperatures on its quality parameters, total carotenoid content, peroxide value, moisture content and color, assess the degradation kinetics of co-crystallized RFO in terms of its quality parameters stored in three different temperatures as well as estimating the shelf life of co-crystallized RFO using accelerated shelf life testing based on Arrhenius model. Significant differences in TCC were observed between samples stored at different temperatures, whereas no significant differences in PV, moisture content and color were observed between samples stored at different temperatures. TCC degrades with the first-order kinetic reaction, whereas PV and color degrades with zero-order kinetic reaction. Total carotenoid content has the highest activation energy of 836.01 J/mol K, and shelf life of 480 days at 20 °C and 322 days at 25 °C. Followed by peroxide value with an activation energy of 276 J/mol K and shelf life of 95 days at 20 °C and 83 days at 25 °C. Color has the lowest activation energy and shortest shelf life period of 119.05 J/mol K and shelf life of 10 days at 20°C and 9 days at 25°C. Moisture content does not fulfill the R^2 value requirement for the Arrhenius model. Estimation of shelf life is based on the quality parameter of PV.

Keywords: *Co-crystallization, Red fruit oil, shelf life, total carotenoid content, peroxide value, color, degradation kinetics*