

Effect of frying on the rheological and chemical properties of palm oil and its blends

Abstract

The aim of this research was to determine the changes in the physicochemical properties of palm oil and its blends by FTIR and rheological measurements. Application of heat produces some chemical compounds as impurities and even toxic compounds in oils and fats that give absorbance at different region. FTIR spectra of pure palm olein shows an absorbance at 3002 cm^{-1} whereas other pure oils show maximum absorption at around 3007 cm^{-1} due to C-H stretching vibration of cis-double bond (=C-H). By blending of high unsaturated oils with palm olein, a clear shift of 3007 cm^{-1} band to 3005 cm^{-1} occurs. Viscosity of palm olein was found higher among all oils while it subsequently and substantially reduced by blending with other oils. Since it is a function of temperature, viscosity of pure oils and their blends decreases with the increase of temperature. The loss modulus (G''), for all oil blends before and after frying, in rheological experiment was found higher for all oils than the storage modulus (G'), therefore, the viscous property was found higher than elastic property of oils and blends. However, the critical stress for all oil blends was found higher than that of pure oils.

Keywords

FTIR; Oil blends; Palm olein; Rheology