OXYGEN ABSORPTION STUDIES OF FATTY ACIDS OF RUBBER SEED AND MELON SEED OILS AND THEIR BLENDS: EFFECTS OF TEMPERATURE AND BLENDING

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The oxygen absorption of rubber seed oil fatty acids (RSA) and melon seed oil fatty acids (MSA) and their blends were monitored at one hour interval for five hours at 31.5 °C, 45 °C, 60 °C, 75 °C and 90 °C. Moles of absorbed oxygen were calculated from pressures of un-reacted oxygen using the ideal gas equation. The oxygen absorption increased with time, the rate being high initially at all temperatures except for 90 °C when the optimum oxygen absorption was reached after about four hours. Pure RSA and blends containing higher proportion of RSA showed higher oxygen absorption than pure MSA at different test temperatures except for the initial period at 31.5 °C.

Keywords: Melon seed oil fatty acids, Oxygen absorption, Rubber seed oil fatty acids.

The paint industry plays a major role in the Nigerian economy. However, the contribution of this industry has significantly dwindled, mainly due to lack of raw materials. Most of the raw materials, especially the film forming, lipid base component are imported and not readily available. The source of this lipid base component is usually linseed oil, which is mostly made up of linolenic and linoleic acids. Rubber seed oil has a lipid composition that mimics that of linseed oil to some extent, containing considerable amounts of linolenic (16.3%) and linoleic (39.6%) acids. The total polyunsaturated fatty acids in rubber seed oil is about 79%, with iodine value of 135.3 making it a semi drying oil (Aigbodion and Pillai, 2000). Melon seed oil has acomposition of 69.21% unsaturated fatty acids and is also semi-drying oil with an iodine value of 119 (Mirjana and Ksenija, 2005). These two oils could probably replace linseed oil used as a lipid base in the paint industry either fully or partially.

The alkyd resin or fatty acid binders present in paints absorb atmospheric oxygen and form solids thereby coating the surfaces on which they are applied (Mattil *et al.*,1964). The oxygen absorption capability of such binders rest on the content of unsaturated fatty acids present in the vegetable oils.