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PRELIMINARY STUDIES ON THE PREPARATION OF RUBBER SEED OIL ALKYDS

A. I. Aigbodion

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Three samples of alkyd resins having 45, 52 and 62 per cent of oil were prepared using phthalic anhydride, glycerol and rubber seed oil extracted by a screw press. Progress of the reaction was followed by measurement of the acid value of the reaction mixture at 30 min intervals. The monoglyceride formed did not make a clear solution in methanol (1:3) due to presence of impurities in the oil and the dark colour of the oil resulted in the formation of dark coloured alkyds. Extents of esterification calculated at the time when there was a sharp decrease in acid value were 69.92, 77.82 and 61.48 per cent for the three samples. The calculated degrees of polymerization indicated formation of appreciable high molecular weight resins. The finished alkyds were soluble in xylene (3:2 dilution). The resins were of good quality, but their properties varied with the oil content.

Key words:- Rubber seed oil, Alkyd resins, Gelation.

A. I. Aigbodion, Rubber Research Institute of Nigeria, P. M. B. 1049, Benin City, Nigeria.

INTRODUCTION

Oil-modified alkyd resins constitute a major group of resins used as vehicles and binders in surface coating industry. In Nigeria, the demand for alkyd resins has increased tremendously in recent years (Akinnawo, 1989). Yet technical information on local production is scanty.

The popularity of alkyds as vehicle for coatings is largely due to their film hardness durability, gloss and gloss retention, resistance to abrasion, etc, imparted on them through modification with drying oil (Kraft, 1959). Thus large quantities of drying oils are needed for the polycondensation reaction involving polybasic acid or the anhydride and the polyol. However, drying oils are available locally which have remained untapped. These include rubber seed oil, soybean oil, walnut oil and tobacco oil (Adefarati, 1986). Among these vegetable oils, rubber seed oil is unique because of its relative abundance and the level of unsaturation (Uzu *et al.*, 1986). It has been observed earlier in Sri Lanka and India that the properties of rubber seed oil resemble those of linseed oil (Haridasan, 1977; Nadarajah *et al.*, 1973). Rubber seed oil was therefore conceived as having strong potential for replacing (wholly or partially) linseed oil, which is currently being imported, in alkyd production. This preliminary study is an attempt to explore this possibility.

EXPERIMENTAL

Materials

Laboratory grade glycerol and phthalic anhydride from BDH were employed in the polycondensation reaction. Rubber seed oil was extracted mechanically from one year old seeds.