

# Extraction, Characterization And Industrial Applications Of Tobacco Seed Oil (NICOTIANA TABACUM)

CHINWEUBA ARINZE JUDE

PURE AND INDUSTRIAL CHEMISTRY DEPARTMENT

ANAMBRA STATE UNIVERSITY, ULI

## Abstract

Oil was extracted from ground *Nicotiana tabacum* seeds by soxhlet. The percentage oil yield was  $36.75 \pm 0.50\%$ . The quality of the oil was assessed in terms of acid value, iodine value, saponification value, free fatty acid content, specific gravity and drying oil, highly unsaturated, non-acidic and would require little purification. The oil could be used for production of hair shampoo shoe polish and could be commercialized due to its high oil yield.

**Key words:** *Nicotiana tabacum* seed oil, extraction and Industrial application.

## INTRODUCTION

*Nicotiana tabacum* is a perennial herbaceous plant. It is a native of tropical and subtropical America but is now cultivated Worldwide. In Nigeria, improved variety of this plant is notably used as ornamental plant. *Nicotiana tabacum* is highly sensitive to temperature and ground humidity of 80-85%. The seeds are very numerous, very ovoid and brown in colour. Every part of the plant except the seed contains nicotine. The plant has been used as an antispasmodic, a diuretic, an eructic, an expectorant, a sedative and sialagogue, (Groark et al 2010).

This research paper reports extraction, characterization and possible industrial applications of *Nicotiana tabacum* seed oil.

## METHODS

*Nicotiana tabacum* seeds were collected from a garden in Awka, Anambra State of Nigeria. The seeds were air dried for 3 days and crushed to powder in a mortar.

## OIL EXTRACTION

Oil was extracted by soxhlet using petroleum ether ( $60^{\circ}\text{C} - 80^{\circ}\text{C}$ ) and the solvent was distilled off at  $80^{\circ}\text{C}$ . The oil content was calculated from the mass of oil and the mass of seeds.

## REMOVAL OF FREE FATTY ACIDS AND DEGUMMING

The free fatty acid and gum were removed from the crude seed oil by the method described by Wiederman (1981) and the A.O.C.S. Official Method (1960).

## PHYSIO-CHEMICAL PROPERTIES

The iodine value, acid value, saponification value and free fatty acids, were determined by methods, described by Lambert and Muir (1968). The specific gravity was determined by the method given by William (1996). The mean molecular mass was calculated using: mean molecular mass  $56/SV \times 1000$ .

## RESULTS AND DISCUSSION

The oil obtained from *Nicotiana tabacum* seed had a light yellow colour and remained liquid even at room temperature. The oil content of  $36.75 \pm 0.56\%$  showed that processing of the oil is economical (Ajiwe et al 1995). The physiochemical properties depicted in Table I. Showed that the oil was highly unsaturated and semi-drying. The semi-drying nature of the oil and its saponification value made it suitable for the production of hair shampoo and shoe polish (Ajiwe et al 1994)

**Table I: Characterization of *Nicotiana tabacum* seed oil**

Parameters	Values
Oil content of seed (%)	$36.75 \pm 0.50$
Iodine value (g/100g)	$119.00 \pm 1.10$
Saponification value (mg/g)	$186.00 \pm 2.00$
Acid value (mg/g)	$9.60 \pm 1.20$
Free fatty Acid (mg/g)	$4.80 \pm 1.20$
Specific gravity at room temperature ( $^{\circ}\text{C}$ )	0.92
Mean molecular mass	301.07
Ash content %	10.00

**Table II: Formulation of hair shampoo**

Components	% Composition
<i>Nicotiana tabacum</i>	20.00
Water	52.20
Potassium hydroxide	17.00
Sodium lauryl sulphate	0.40
Formaldehyde	0.20
Sodium stearate	0.20
Dye	D.q
Perfume	D.q

SV = Saponification value

Dq = Desired quantity

**TABLE III: FORMULATION OF SHOE POLISH**

Components	Composition %
Nicotiana tabacum oil	13.90
Paraffin wax	20.99
Bees wax	6.94
Carbon black	2.78
Turpentine	42.67

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