

SPECIAL COLLECTION
LIBRARY USE ONLY



National University of Science and Technology

Think in Other Terms



FACULTY OF APPLIED SCIENCE

PROJECT TITLE: DETERMINATION OF NORNICOTINE AND NICOTINE IN
TOBACCO ON THE GAS CHROMATOGRAM FLAME IONIZATION DETECTOR

MPOFU SIKHANYISO N01310385V

SUPERVISOR: DR. CT PAREKH

LIBRARY NATIONAL UNIVERSITY OF SCIENCE AND TECHNOLOGY		
DATE	ACCESSION	CLASS No.
13/02/2019	SC 11068	

A DISSERTATION SUBMITTED IN PARTIAL FULFILLMENT OF
REQUIREMENTS FOR:

BACHELOR OF SCIENCE HONORS OF DEGREE IN APPLIED CHEMISTRY



TOBACCO RESEARCH BOARD
KUTSAGA



* 9 2 0 0 4 0 4 6 0 4 2 *

NUST Library



ABSTRACT

In recent years, research carried out by tobacco chemists has shown the secondary alkaloid normicotine to be a precursor to the metabolism of the carcinogen N-nitrosornicotine (NNN) hence, highlighting the need to develop chromatographic methods of analysis that quantify and qualify not only the highly addictive nicotine but normicotine as well. The gas chromatograph (flame ionisation detector) offers superior resolution and wide linear range suitable for such an analysis. Conventional steam distillation extraction of the tobacco alkaloids is used with subsequent liquid-liquid extraction in order to avoid backflash effects that result in peak splitting and tailing as a result of using water as the solvent.

Dichloromethane was chosen as the organic solvent. The recovery of the analytes was found to be approximately 88.97 and 89.72% for normicotine and nicotine respectively. Normicotine and nicotine were eluted at 2.84 min and 3.66 min respectively upon chromatographic analysis. The calibration curves for both analytes were linear with correlation coefficients of 1 and 0.998 for normicotine and nicotine respectively. Mass spectrometric analysis showed the presence of other secondary alkaloids within the tobacco extract. These included myosmine, anabasine, anatabine and isonicotine. The developed method was successfully used in the determination of normicotine and nicotine in real tobacco samples.