

THE UNIVERSITY OF THE WEST INDIES

ST. AUGUSTINE, TRINIDAD & TOBAGO, WEST INDIES

FACULTY OF SCIENCE AND TECHNOLOGY

DEPARTMENT OF CHEMISTRY

Telephone: (868) 662-2002 Ext. 82091, 82092, 83570 E-mail: chemistry.rocas@sta.uwi.edu

Test Report

Determination of Alcohol Content (%) in Sanitizer Products

Report Prepared for:

Ms. Shandell Best
Chem Clean Limited

Analyses Conducted by:

Ms. Devika Maharaj
Laboratory Technician

Report Prepared by:

Dr Faisal Mohammed
Contract Officer III

Research Outreach Consulting & Analytical Services

Date:

15 July, 2021

INTRODUCTION

One (1) sanitizer sample was delivered to the Department of Chemistry of The University of the West Indies, St Augustine by the Client for determination of percentage alcohol content. This report presents the result for the following sample:

Product Name	Date Delivered
Rubbing Alcohol	13.07.2021

METHOD:

Chemicals/Reagents

Isopropanol /IPA (BDH, 99.0%) and *n*-butanol (Sigma Aldrich, 99.5%) were used for standard and sample preparations. The standards and samples were diluted in deionized water to specified concentrations.

Instrumentation

A Shimadzu GC-2014 Gas Chromatograph equipped with split/splitless injector (SPL) and flame ionization detector (FID) was used for this analysis and the data were acquired, analyzed and reported using the *GCsolution* software. The method parameters are shown in Table 1 below.

Table 1. Methods parameters for determination of alcohol content in sanitizers

GC system	Shimadzu GC-2014 with SPL and FID
Column	SHRX-5, 15m x 0.25mm x 0.25µm
Injector Mode	Split at 1:90 ratio
Injection Volume	2.0 µL
Carrier Gas	Helium (He)
Flow mode	Constant linear velocity of 12cm/sec
Column Temperature	35°C — 50°C @ 1°C/min
Injection Port Temperature	275°C
FID Temperature and Carrier Gas Flow Rate	300°C, Helium 39.4mL/min

Preparation of Calibration Curves

Quantification was obtained using the Internal Standard Method. Stock concentrations (20%, 40%, 60% and 80%) of IPA solutions were prepared in deionized water. Working standard solutions of each concentration (20%, 40%, 60% and 80%) were prepared in separate flasks by adding 5 mL IS (5% *n*-butanol), 5 mL of the respective IPA stock solution and diluting to 50mL with deionized water. 2 µL of each working solution was injected into the instrument and the peak areas of IPA and IS were obtained. The IPA to *n*-butanol peak area ratio was calculated for each working standard and a plot of peak area ratio against % concentration was generated. The calibration curve obtained is shown in Figure 1.

This report shall not be reproduced except in full without approval of the laboratory

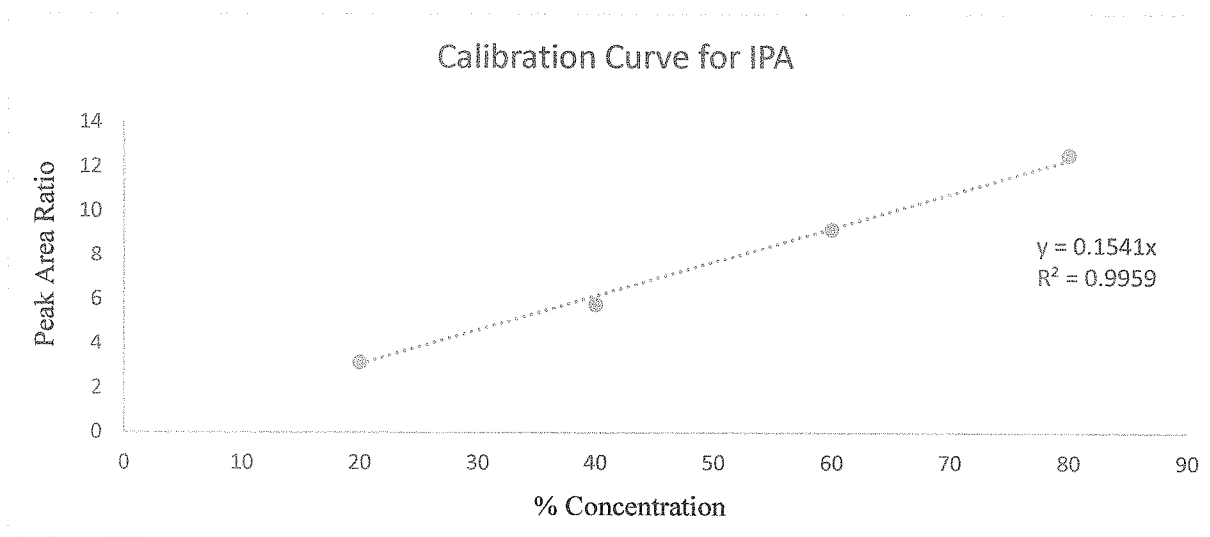


Figure 1. Calibration Curve for Isopropanol

Preparation of Sanitizer Samples

5 mL of sample and 5 mL of IS (5% *n*-butanol) was diluted to 50mL with deionized water. 2 μ L of the diluted sample was injected into the instrument and the peak areas of IPA and IS were obtained. The IPA to *n*-butanol peak area ratio was calculated and the % IPA concentration was determined using the slope of the graph (0.1577) according to the following equation:

$$\% \text{ Concentration} = \frac{\text{Peak Area Ratio for Sample}}{\text{Slope of Graph}}$$

Analyses were conducted in duplicate and results reported as mean \pm standard deviation.

This report shall not be reproduced except in full without approval of the laboratory

RESULTS¹:

A sample chromatogram is shown in Figure 2 below:

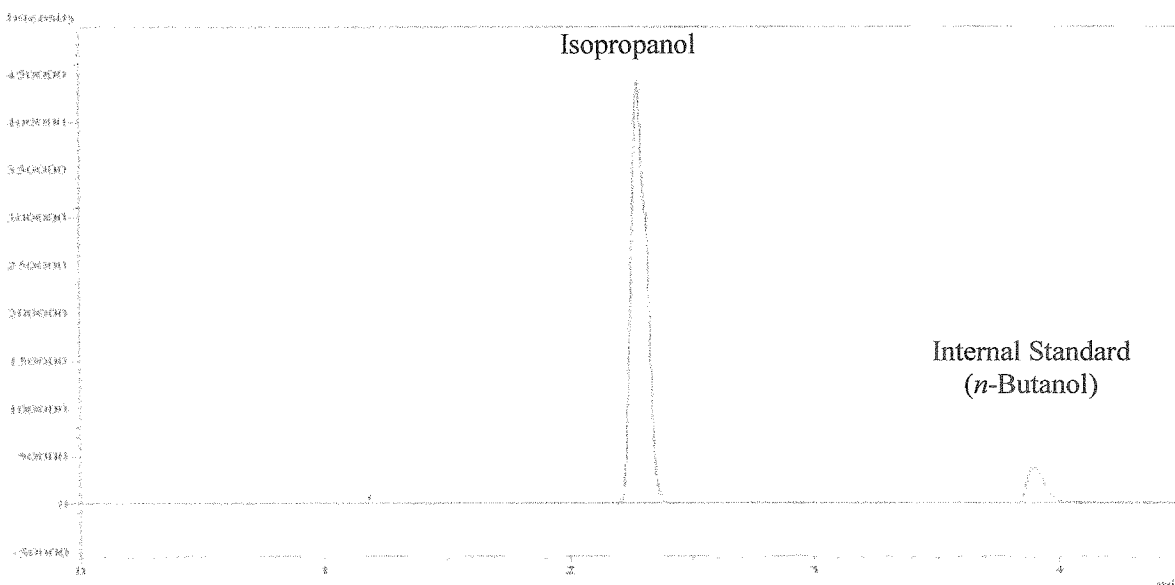


Figure 2. Sample Chromatogram

The percentage alcohol (Isopropanol) content (v/v) in the sanitizer sample is reported in Table 2 below:

Table 2. Percentage alcohol content in sanitizer sample

Sample I.D.	Isopropanol concentration (% v/v) (Mean \pm Standard Deviation)
Rubbing Alcohol	70.24 \pm 2.08

End of test report

¹ These test results relate to the specific sample(s) analysed and are intended to be used for information purposes only.

This report shall not be reproduced except in full without approval of the laboratory