

Differentiation between isopropyl alcohol from various manufacturers

This Application Note shows the rapid, non-destructive identification of isopropyl alcohol from two manufacturers using Raman spectroscopy following the creation of a suitable

library. The measurements with the handheld Raman spectrometer Mira M-1 require no sample preparation and provide immediate results that identify the samples unambiguously.

INTRODUCTION

Organic solvents like isopropyl alcohol are required in the production of many beauty and cosmetic products, paints, fragrances, and in synthesis reactions – the latter in particular in pharmaceutical applications.

In this work, isopropyl alcohol samples from two

different suppliers were analyzed and the differences in the spectra were investigated. Unexpectedly, the spectra showed some differences, allowing a supplier-specific identification.

EXPERIMENTAL

All spectra were measured using the Mira M-1 Raman spectrometer in auto-acquisition mode, i.e., integration times were determined automatically. A laser wavelength of 785 nm

and the Orbital-Raster-Scan (ORS) technique were used. The isopropyl alcohol samples were analyzed in vials using the vial holder attachment of the Mira M-1.

RESULTS AND DISCUSSION

Two different suppliers of isopropyl alcohol were evaluated. Due to the visible differences in the spectra indicating a possible contamination of

the samples the Raman spectroscopic distinction was possible (see **Figure 1**).

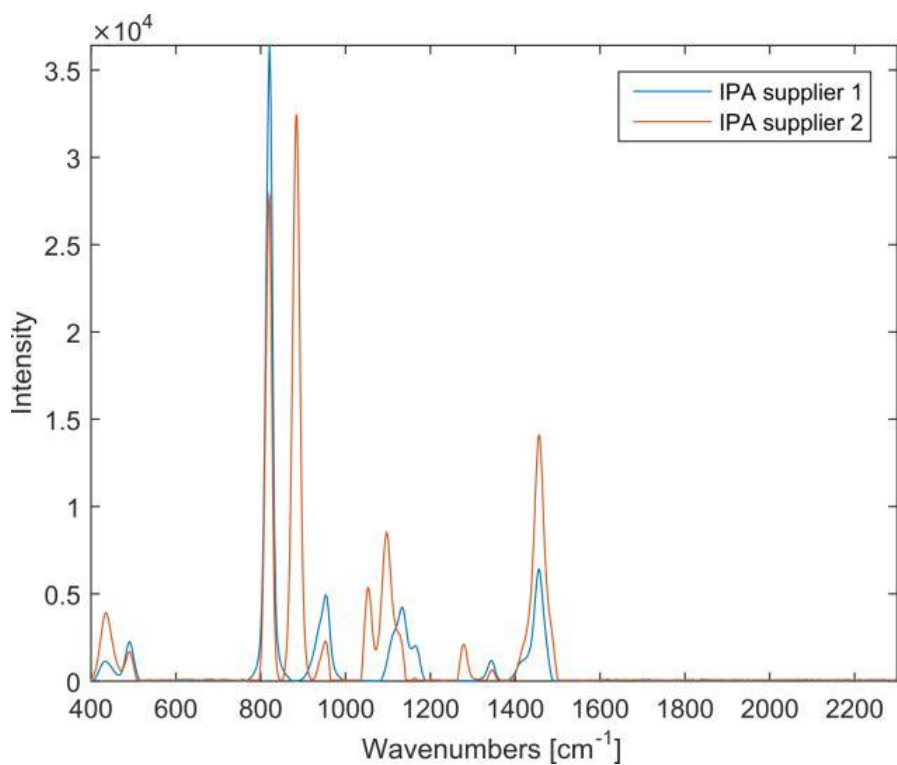


Figure 1. Spectra of isopropyl alcohol (Supplier 1 and 2) superimposed with a spectrum of ethyl alcohol

The peaks at $1400\text{--}1470\text{ cm}^{-1}$ correspond to the asymmetric vibrations of $\delta(\text{CH}_2)$ and $\delta(\text{CH}_3)$. Between $600\text{--}1300\text{ cm}^{-1}$, aliphatic chain vibrations for $\nu(\text{CC})$ can be found. In both samples of isopropyl alcohol, peaks in those areas can be observed.

Changes come up when focusing on the peaks at 883 , 1049 , 1095 , and 1276 cm^{-1} , since those peaks, according to literature, suggest the presence of ethyl alcohol in the sample (see **Figure 2**).

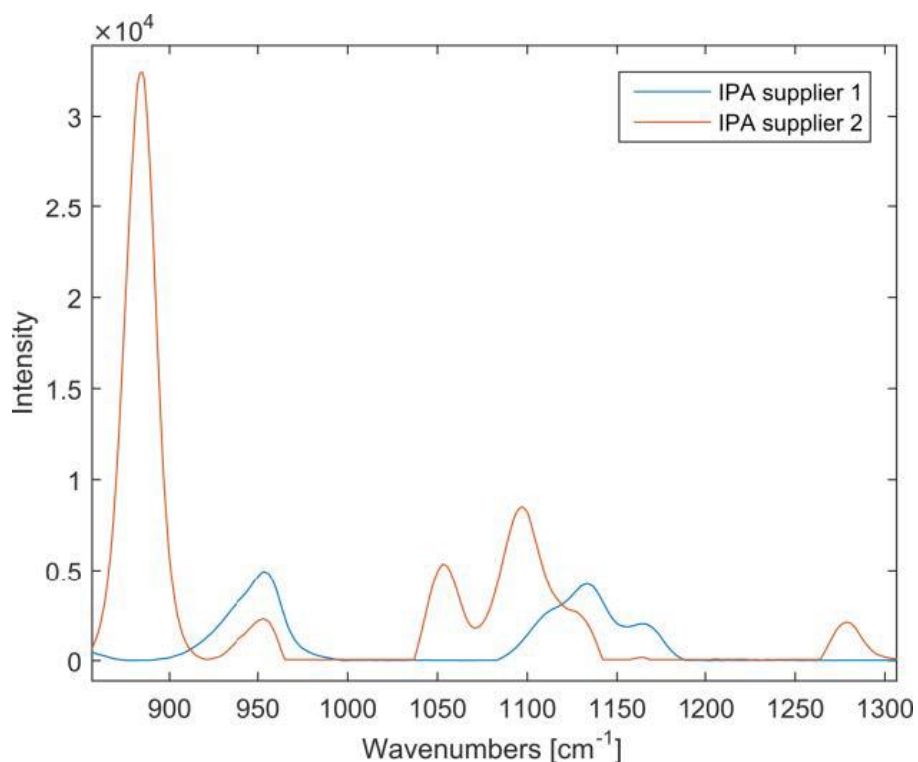


Figure 2. Differences between the isopropyl alcohol spectra.

CONCLUSIONS

Comparing the spectra of the two isopropyl alcohol samples, it becomes obvious that there is ethyl alcohol in the isopropyl alcohol sample of supplier 2. With Mira M-1, it was possible to

distinguish the different suppliers, proving that Mira M-1 is suited for the identification of incoming raw materials such as solvents and alcohols.

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CONFIGURATION



MIRA P Advanced

瑞士万通快速拉曼分析 (MIRA) P 是一款性能大的手持式拉曼光,可用于各材料的快速无定和,例如物有效成分和形。MIRA P 小而固,具有高效的,配了万通独一无二的逐格描技 (ORS)。MIRA P 符合 FDA 邦法 21 章第 11 款的定

。Advanced Package 包含一个附加透,可用它直接分析材料或者在材料容器中分析(3b 激光器),有一个小管支架套筒用于分析玻璃小管中的本(1 激光器)。