Lightnovo

Alco Sens

tool for displaying alcohol quality and counterfeit products detection

https://lightnovo.com
Blokken 15, 1. tv.
3460 Birkerød
Denmark (DK)
+45 71 37 04 10

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AlcoSens is capable to distinguish between fake and original whisky via the bottle without opening it and can be applied for identification of counterfeit white wine, cognack, vodka, whiskey, tequila, rum and other alcohol drinks.

GENERAL FACTS

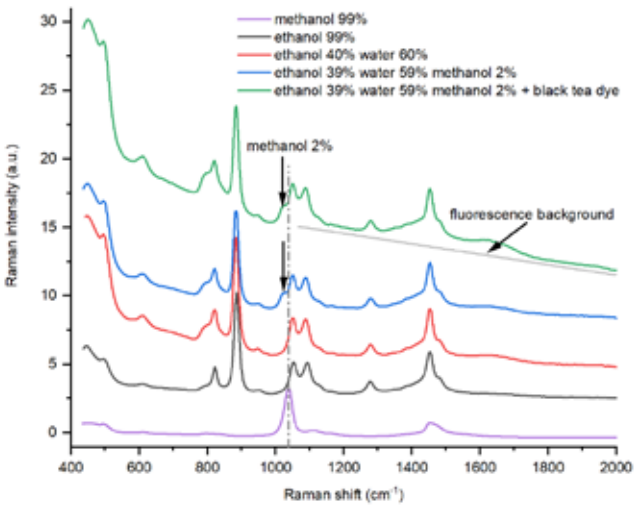
Methanol is a deadly poison contents in low quality or counterfeit alcoholic drinks. It's a serious problem can be harmful or even lethal. We have the solution to detect it in several seconds without opening a bottle.

AlcoSens main benefits are:

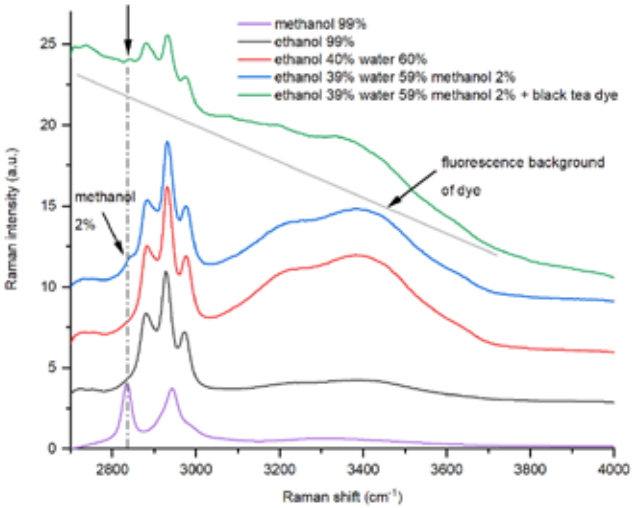
- Conterfeit products detection without openning the bottle
- Analysis time – **2-5 sec**
- Methanol detection down to 0.5% via the bottle
- AlsoSens can be applied for identification of conterfeit white wine, cognac, vodka, whiskey and other alcoholic drinks

AlcoSens is capable to distinguish between fake and original whisky via the bottle without opening it. It is demonstrated that methanol concentration down to 0.5% can be detected via the bottle; it is demonstrated that fluorescence can be used for differentiation between dyes in water-ethanol-methanol solutions.
It may be difficult to differentiate between similar whisky brands by Raman spectra only. However, they are different by fluorescent background due to color additives (dyes). It is also shown that Raman shift from 660nm laser (2700-4000cm^{-1}) can be more sensitive for dye differentiation than Raman shift from 785nm laser (400-2000cm^{-1}).

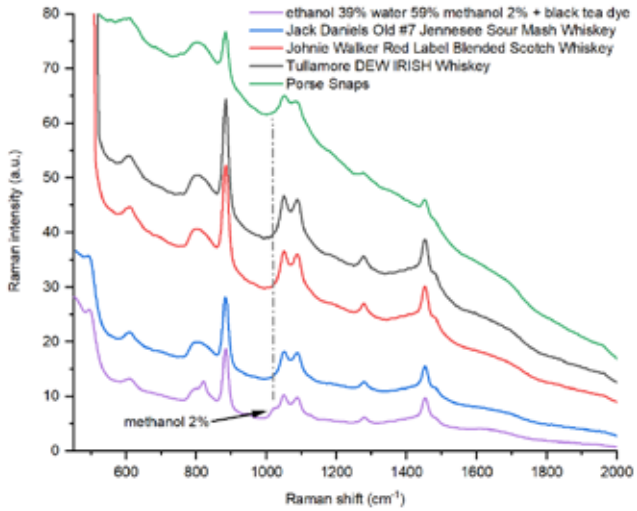
IDENTIFICATION



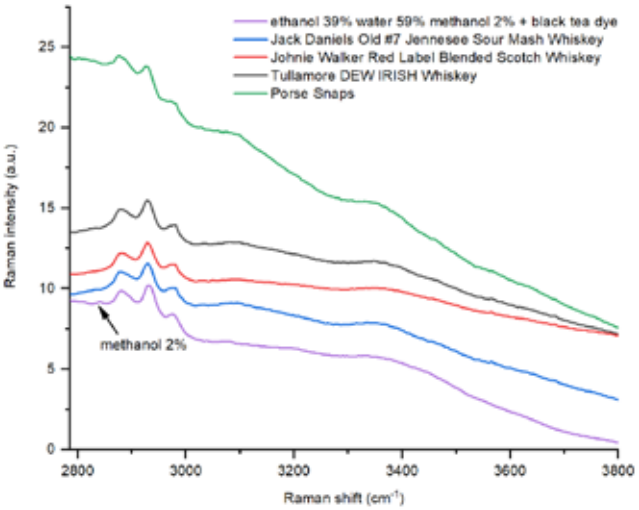
Raman spectra of water-ethanol-methanol solutions obtained from excitation wavelength 785nm, power 148mW at sample, exposure time 1sec, 20 repetitions.



Raman spectra of water-ethanol-methanol solutions obtained from excitation wavelength 660nm, power 16mW at sample, exposure time 1sec, 20 repetitions.



Raman spectra of different whisky obtained from excitation wavelength 785nm, power 148mW at sample, exposure time 1sec, 20 repetitions..



Raman spectra of different whisky obtained from excitation wavelength 660nm, power 16mW at sample, exposure time 1sec, 20 repetitions.

DETAILED SPECIFICATIONS

Lasers

• **785 nm** (power range from **18** to **176 mW** on a sample)

• **785 nm** optional power range is **0.5-5 mW** (for SERS applications)

• **660 nm** (power range from **1** to **32 mW** on a sample)

Spectral Range

• **400-2700 cm^{-1}** (at **785 nm** laser exitation)

• **2750-4500 cm^{-1}** (at **660 nm** laser exitation)

Spectral Resolution

• **7-15 cm^{-1}** (slit size dependent; slit size can be customized)

Sensitivity in point mode at laser wavelength 785 nm

(determined as SNR of polystyrene spectrum)

• SNR **350:1**

• spectral range **400-2700 cm^{-1}**

• laser wavelength **785 nm**

• laser power **100 mW**

• integration time **0.1 s**

• number of repetitions **1**

Sensitivity in point mode at laser wavelength 660 nm

(determined as SNR of polystyrene spectrum)

• SNR **150:1**

• spectral range **2750-4500 cm^{-1}**

• laser wavelength **660 nm**

• laser power **32 mW**

• integration time **0.5 s**

• number of repetitions **1**

Physical dimensions and weight

• weight **400 g**

• dimensions **112 mm x 39 mm x 34 mm**

AlcoSens accessories

• long working distance probe, **f=30 mm** (**NA=0.05**, laser spot size **50 µm**)

• middle working distance probe, **f=15 mm** (**NA=0.1**, laser spot size **15 um**)

• short working distance probe, **f=6.25 mm** (**NA=0.34**, laser spot size **3 µm**)

• immersion probe; for in-vivo skin measurements, direct contact measurements of powders and liquids (**f=6.21 mm**, **NA=0.38**, spot size **2.5 µm**)

• sample holders

• axial focusing accessories

• light protection sample cover

• objective covers

• adapters for standard microscopy objectives (**RMS**, **M25/0.75, M27/1**)

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Blokken 15, 1. tv.
3460 Birkerød
Denmark (DK)
CVR: 40979603

+45 71 37 04 10
info@lightnovo.com
https://lightnovo.com