nika LYTE

Gold Nanoparticle SERS Substrates

for Raman Spectroscopy

Environment

Food

Medical

Narcotics

Pharmaceuticals

Enhanced detection of trace molecules in minutes

Buy Gold SERS substrates, click here

SERS

Surface Enhanced Raman Spectroscopy **(SERS) enables the measurement of trace levels of molecules** that are not detectable using standard Raman techniques. Nikalyte SERS substrates utilize gold nanoparticles generated in vacuum, which are **ultra-pure and free of hydrocarbons**. As **no chemicals are used** in the synthesis of our nanoparticles the SERS substrates are **free of contamination** and **deliver superior sensitivity and specificity**.
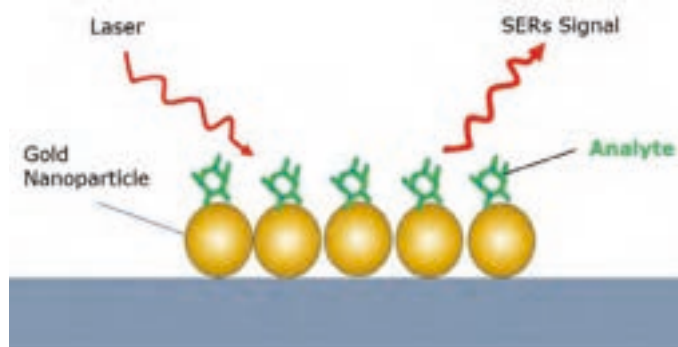
High sensitivity

Several orders of magnitude enhancement in Raman signal.

Detection of ppb levels of a wide range of analytes.

High specificity

High Raman signal to noise for confident identification of similar molecules.

Surface Enhanced Raman Spectroscopy (SERS) using gold nanoparticles.

Raman Spectroscopy, a powerful technique used to identify a wide range of chemical and biological species

Easy to use, in the lab or in the field

Specifications
Nikalyte Au nanoparticle SERS substrate.
Dimensions: (LxW) 75mm x 25mm.

Width 25mm

Length 75mm

A new form of substrate for SERS analysis. It incorporates the ease of use of a solid SERS substrate with the reproducibility of liquid SERS at a cost-effective price point, thus overcoming previous limitations to widespread use of the SERS technique.

SERS active material	Gold nanoparticles
Sensitivity	ppm to ppb
Laser wavelength	785nm, 830nm
Max laser power density	20W/cm²
Active area	6mm x 6mm
Pack size	5 substrates
Lifetime	3 months

Applications...

Environment
Air pollution.
Gas sensing.
Drinking water quality.

Food
Pesticides.
Food contamination.

Medical
Point of care diagnosis.
Biosensors.
Disease detection.
Disease monitoring.
Bacteria detection.
Pathogen detection.

Narcotics
Drugs.
Explosives.

Pharmaceuticals
New medicines.
Toxicology.

...Data

Raman Signal Enhancement

Achieve enhanced Raman signals compared to standard Raman with measured intensities amplified by up to 1000 times for caffeine and a wide range of different analytes.
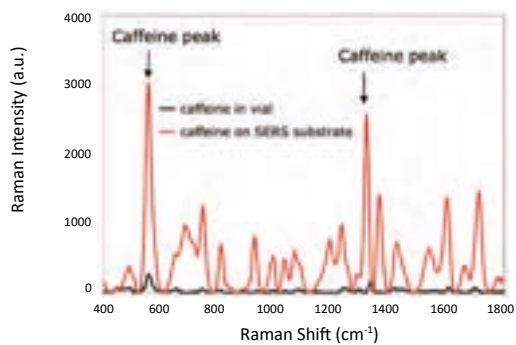

Fig.1. SERS signal enhancement for 1000ppm Caffeine solutions (red) compared to standard Raman (black) measured at 830nm.

High Specificity

The high Raman signal to noise levels exhibited by the ultra-pure SERS substrates facilitate confident identification of similar molecules such as Fentanyl and Amphetamine, where low noise is imperative for the resolution of weaker Raman peaks.
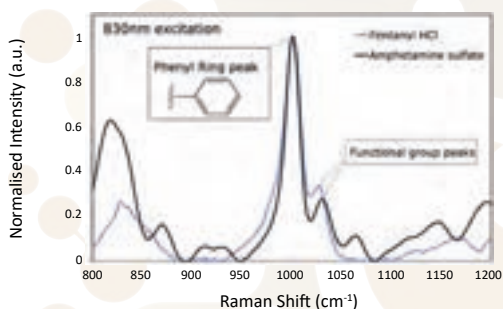

Fig. 2. Resolution of Similar Raman peaks with SERS for fentanyl HCL and amphetamine sulphate measured at 830nm.

Biological

Nikalyte SERS substrates can be used to detect a wide range of biological molecules including proteins, peptides, estrogens and other indicative biomarkers. High Raman enhancement is demonstrated for common dyes including Rhodamine 6G and 1, 2, di(4-pyridyl)ethylene, more commonly known as BPE.
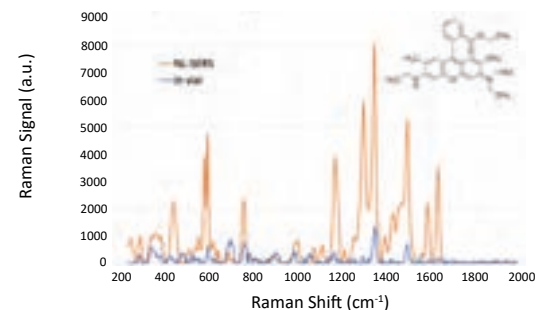

Fig. 3. Raman spectra for 1000ppm Rhodamine 6G solution measured at 785nm with SERS (orange) and standard Raman in vial (blue).
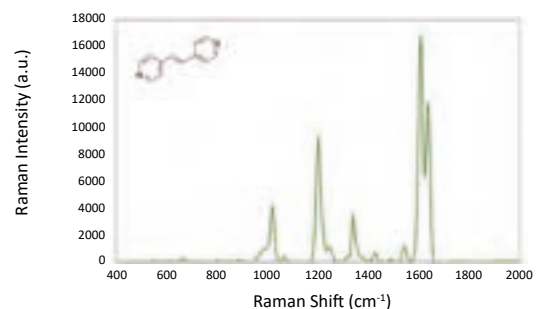

Fig. 4. Raman spectrum measured for 1000ppm aqueous BPE solution measured using gold SERS substrates at 785nm.

SERS

Food Safety

Fast and low-cost identification of food additives and adulterations, including Tartrazine, Melamine and Caffeine, are strict requirements for the adoption of SERS for food safety screening. Fig.5. demonstrates that gold SERS substrates push the limit of detection of Melamine down to 1ppm, compared to 1000ppm with standard Raman Spectroscopy.
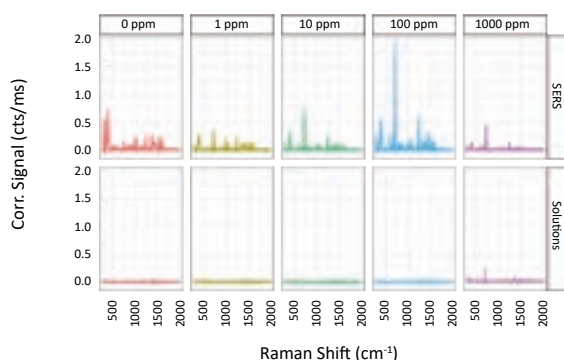

Fig 5. Limit of detection for aqueous Melamine solution measured at 785nm, with SERS (top) and with standard Raman measured in solution (bottom).

Narcotics

The chemical free SERS substrates show high sensitivity for narcotics including MDMA, Fentanyl, Amphetamine, Heroin and PCP. The substrates are lightweight and ready to use from the pack, making them ideal for field use, including law enforcement and border control users.
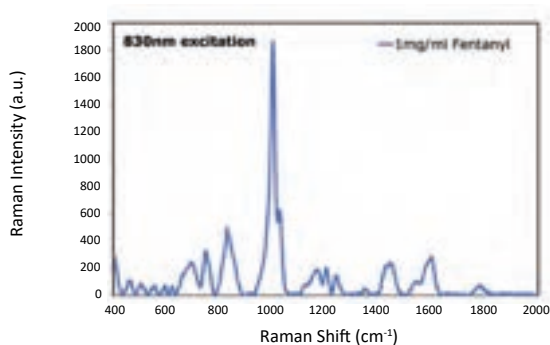

Fig.6. Raman spectrum for fentanyl measured at 830nm.

For SERS research the NL50 is the perfect nanoparticle tool

The easy to use and compact NL50 has been designed specifically for the preparation of plasmonic materials such as gold and silver.

Ideal for plasmonic materials

..Suited to generate gold and silver materials

Control over nanoparticle properties

..Real time control over nanoparticle density
..Control over nanoparticle size

Ultra-pure nanoparticles

..Nanoparticles are ultra pure and ligand free
..Bare nanoparticles are more sensitive to analyte

Flexibility of substrate

..Deposit on any substrate including filter paper, plastic or glass
..Choose substrate to suit your application and Raman excitation wavelength

To find out more about Nikalyte's SERS technology, check out our Application Notes online:

- Surface Enhanced Raman Spectroscopy Analysis of Low Concentration Fentanyl Street Samples. Click here to view.
- Evaluating a novel approach to SERS. Click here to view.
- Pushing the Limits of Raman detection of Melamine with SERS. Click here to view.

Buy SERS Gold substrates direct from our website please **click and shop here.**