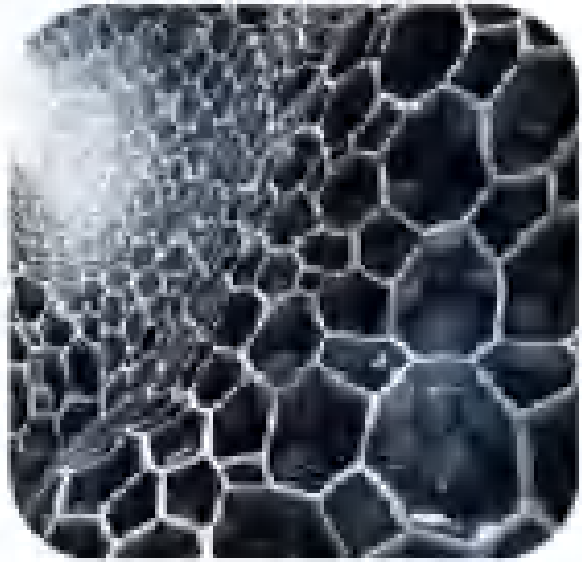
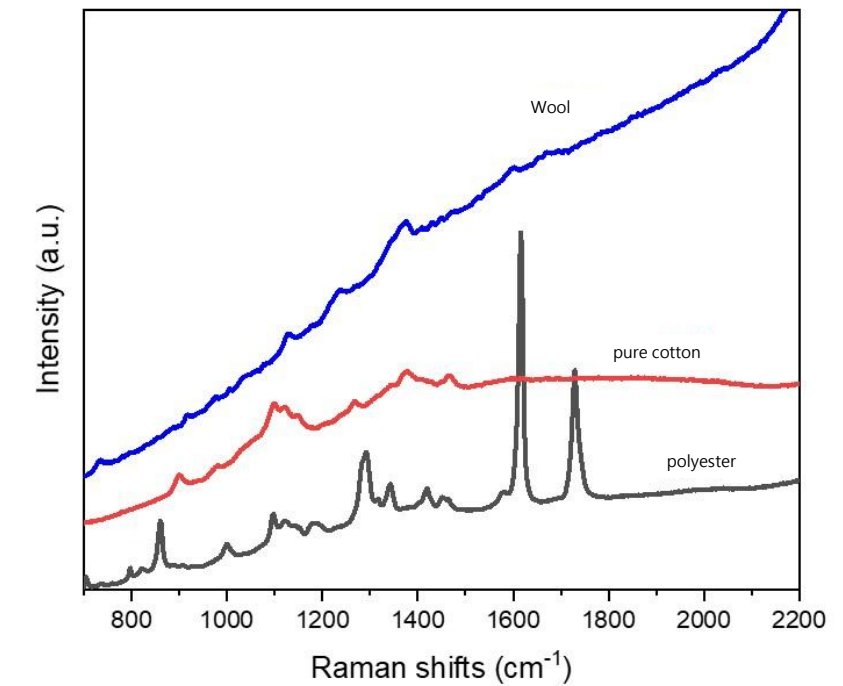


# Application of EduRaman

## Textile Material Analysis



Materials Science



### No Complex Sample Preparation:

Most samples can be analyzed directly without the need for degreasing, drying, or other complex preparation steps.

### High-Precision Identification:

Subtle differences between synthetic fibers (such as polyester and nylon) and natural fibers (such as cotton and wool) can be accurately distinguished.

### Eco-Friendly & Non-Destructive:

Non-contact testing ensures no damage to samples, making it ideal for analyzing high-value textiles.

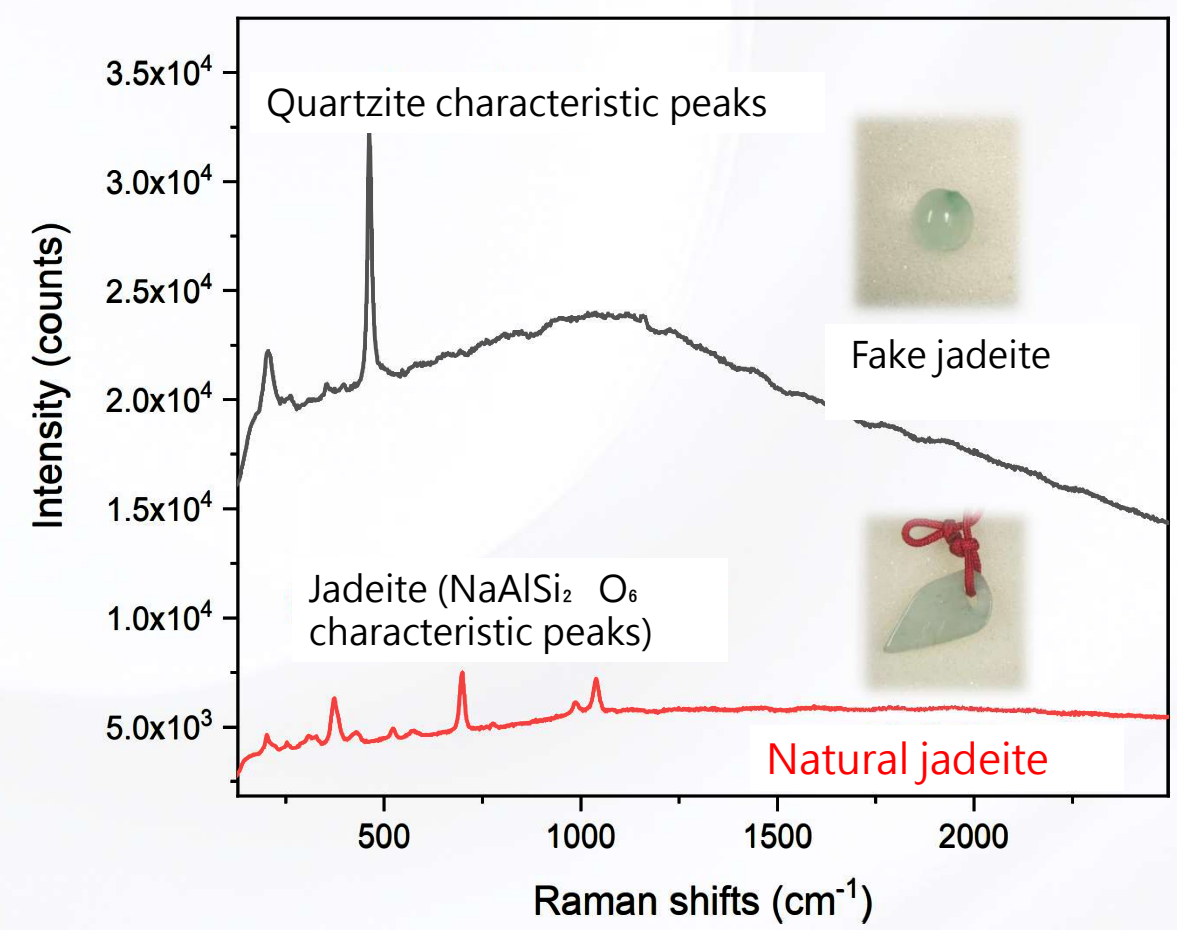
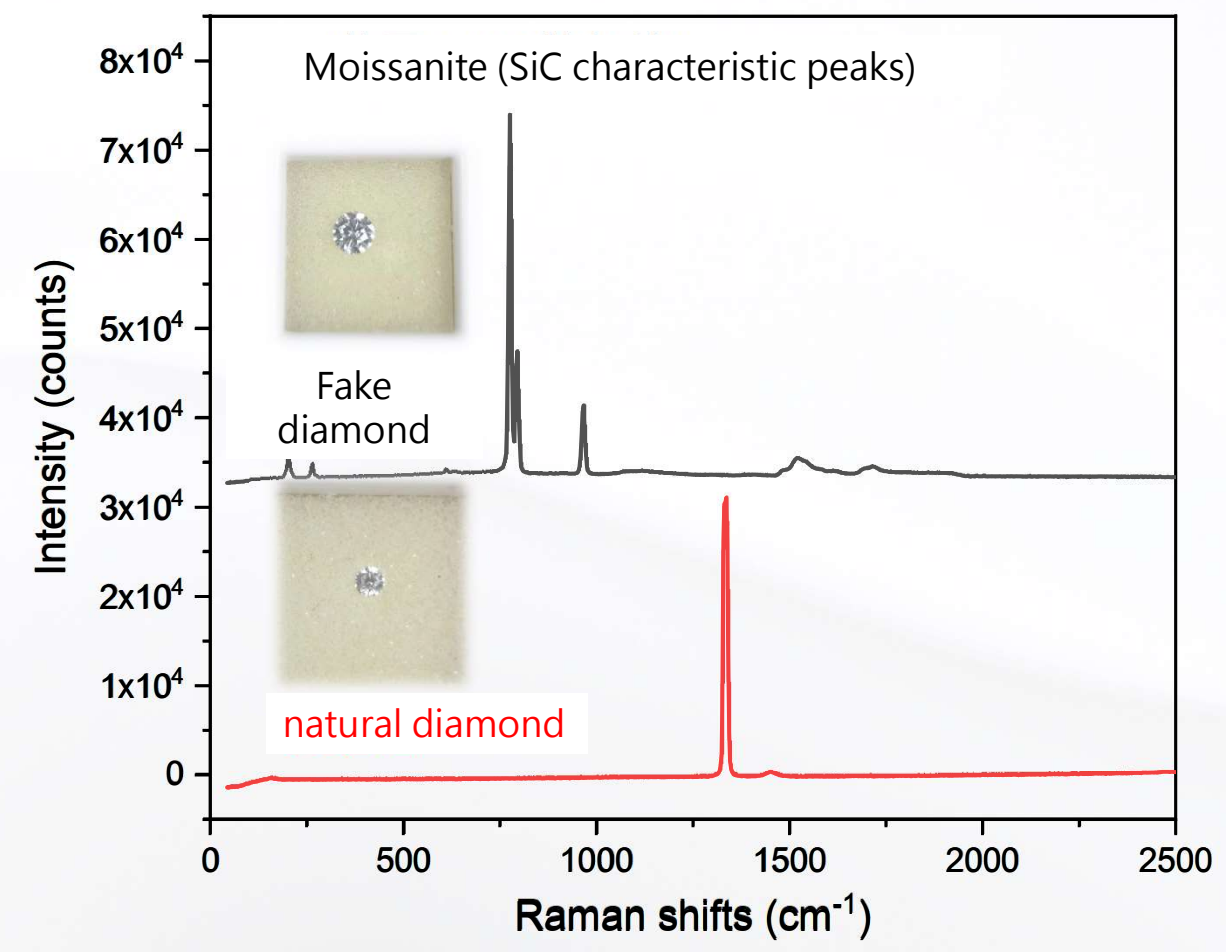
### Rapid Results:

From sampling to spectrum acquisition takes only a few minutes, significantly improving quality inspection efficiency.

# Application of EduRaman



Jewelry Appraisal



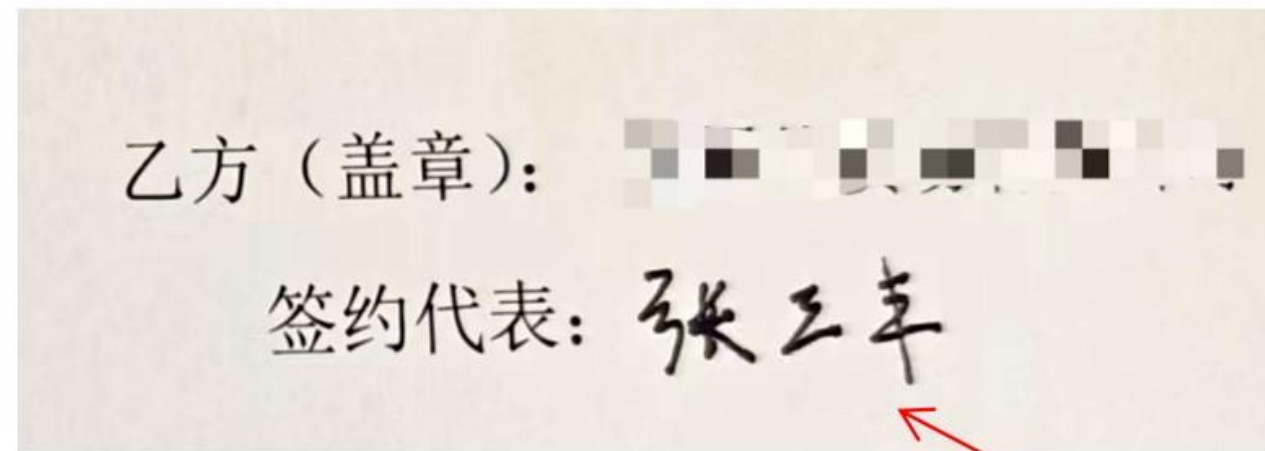
Genuine and imitation diamonds and jade exhibit significant structural differences. Raman spectroscopy enables rapid, non-destructive identification based on characteristic spectral peaks.

# Application of EduRaman



Judicial Criminal Investigation

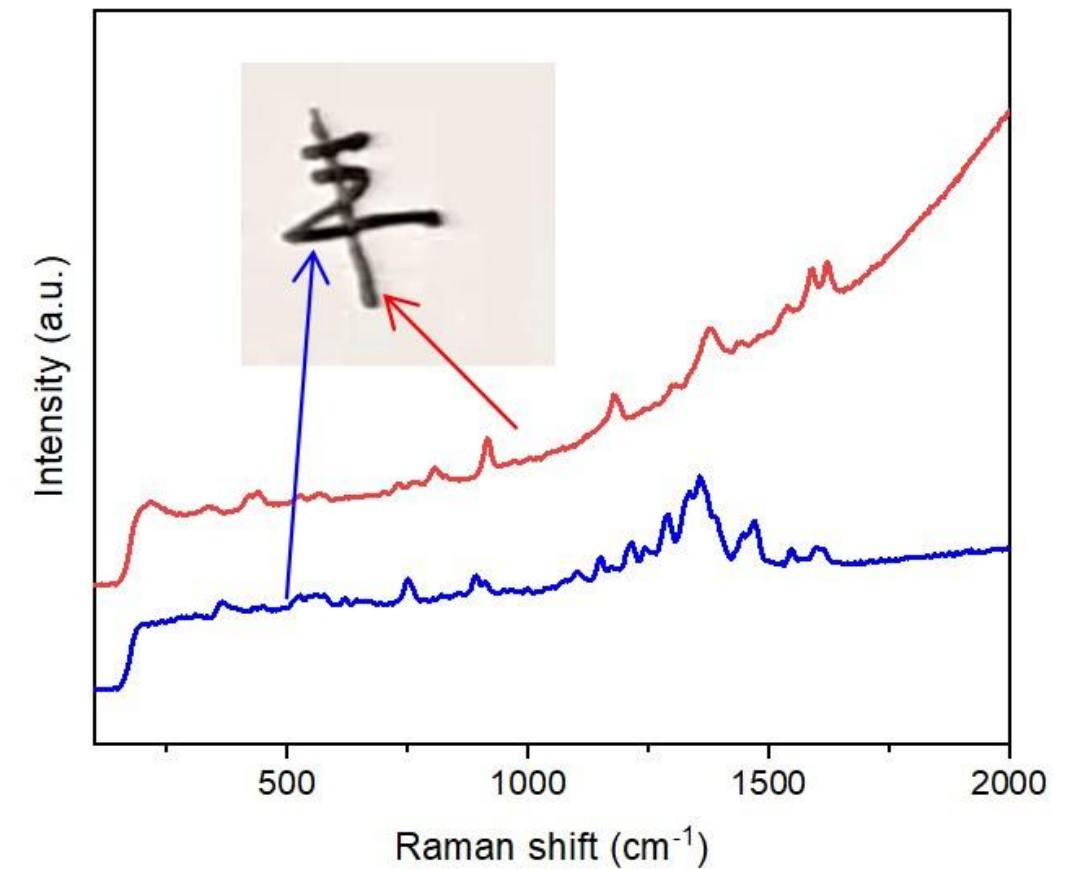
## Handwriting Identification



Original Handwriting : 张三三

Altered Content : "1" was added.

The altered handwriting was made using a different pen.



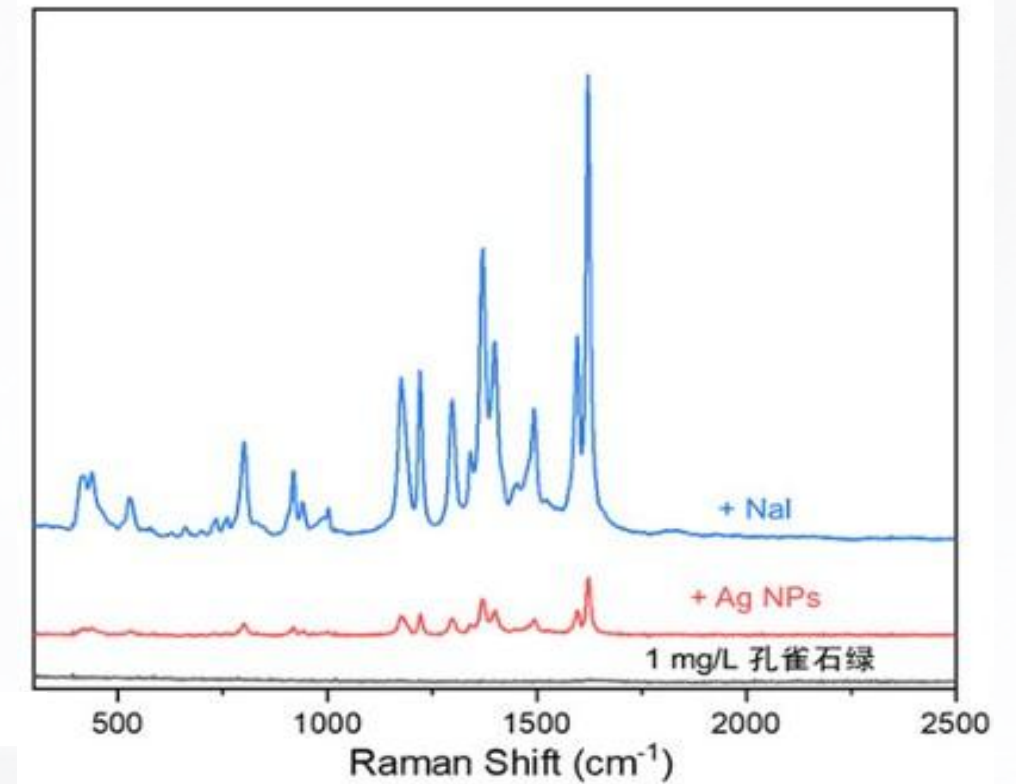
- ✓ Rapid, non-destructive analysis of ink on questioned documents.
- ✓ Identifies whether different pens were used to verify handwriting authenticity.

# Application of EduRaman

## Detection of Malachite Green in Aquaculture Water



Environmental Testing

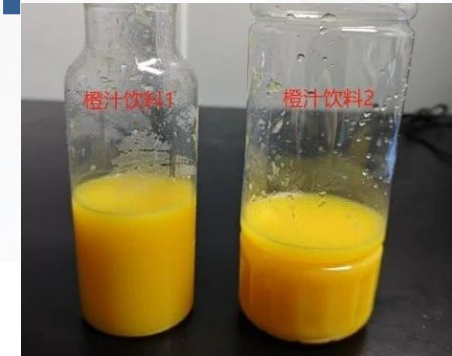


- ✓ Raman spectroscopy combined with Surface-Enhanced Raman Spectroscopy (SERS) enables rapid and highly sensitive detection of toxic malachite green in water.

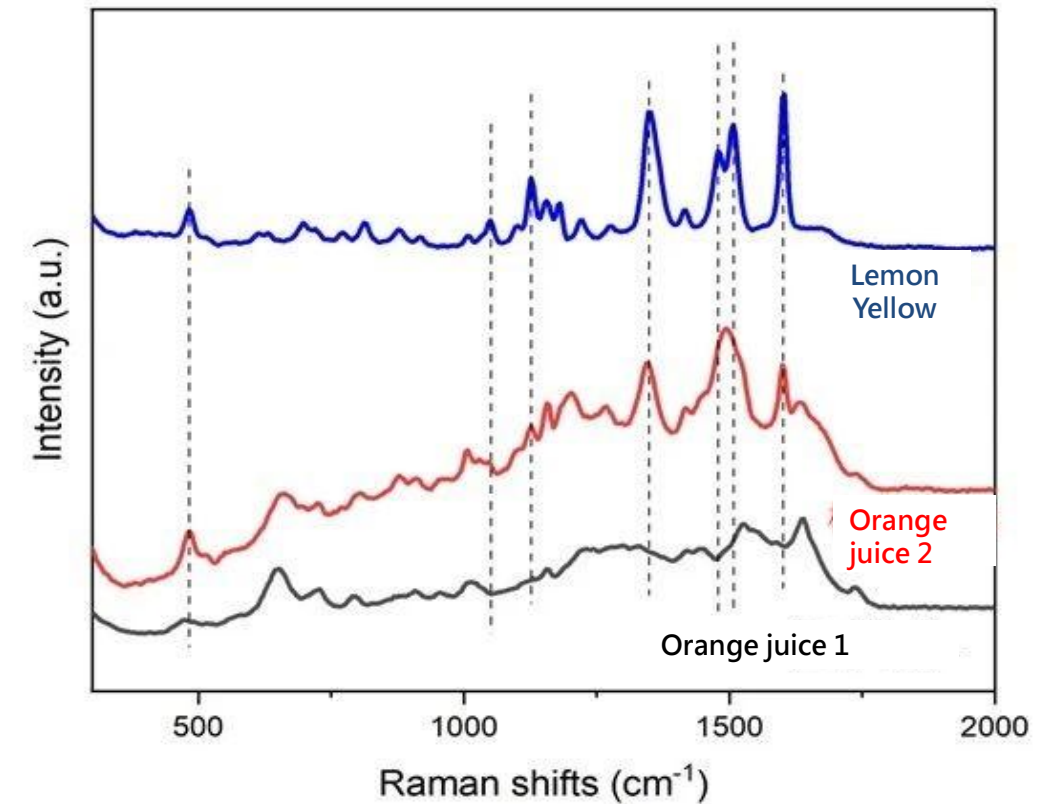
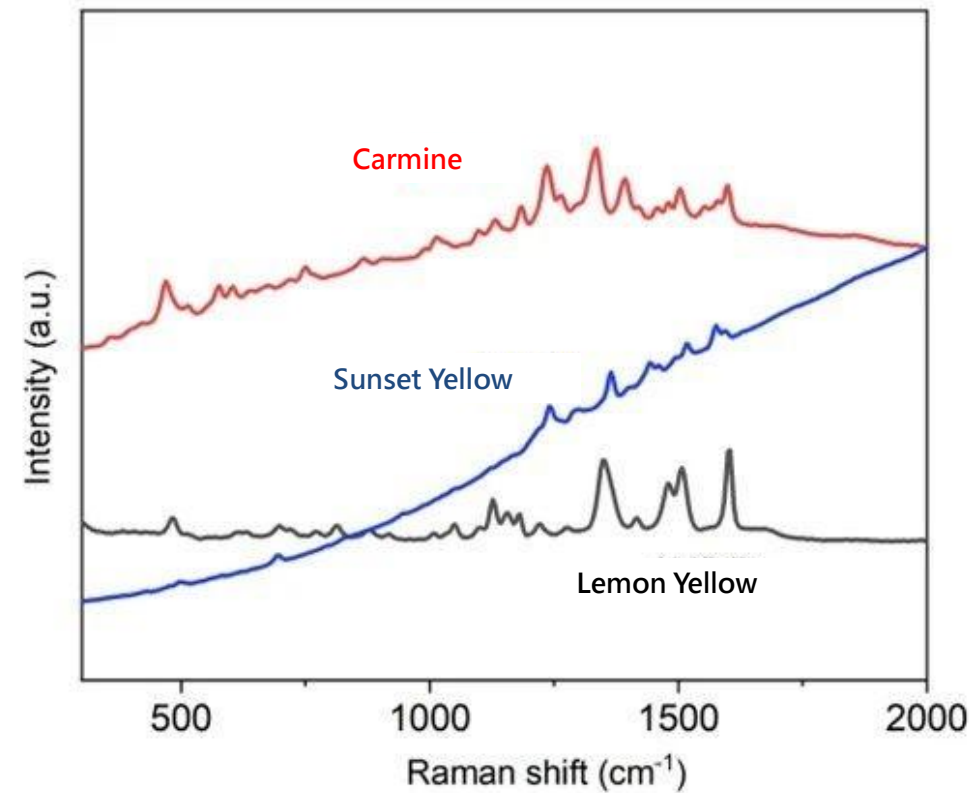
# Application of EduRaman



Food Safety



## SERS Analysis of Common Food Colorants

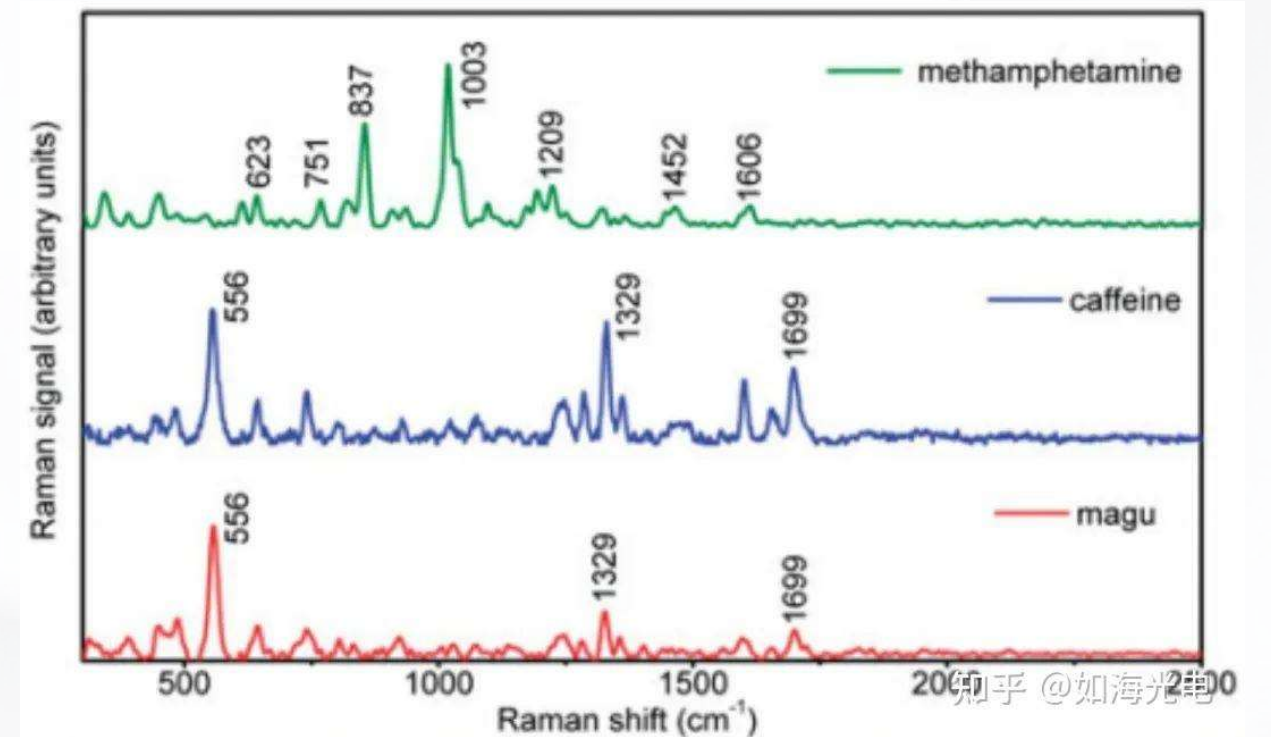


Orange juice sample 2 contains lemon yellow dye. By adding a small amount of the sample with silver nanoparticle SERS reagent, Raman spectroscopy can rapidly detect the characteristic peaks of the dye. Under the same conditions, no characteristic peaks of the dye were detected in orange juice sample 1 without added colorant.



Public Safety

## Drug Screening and Identification

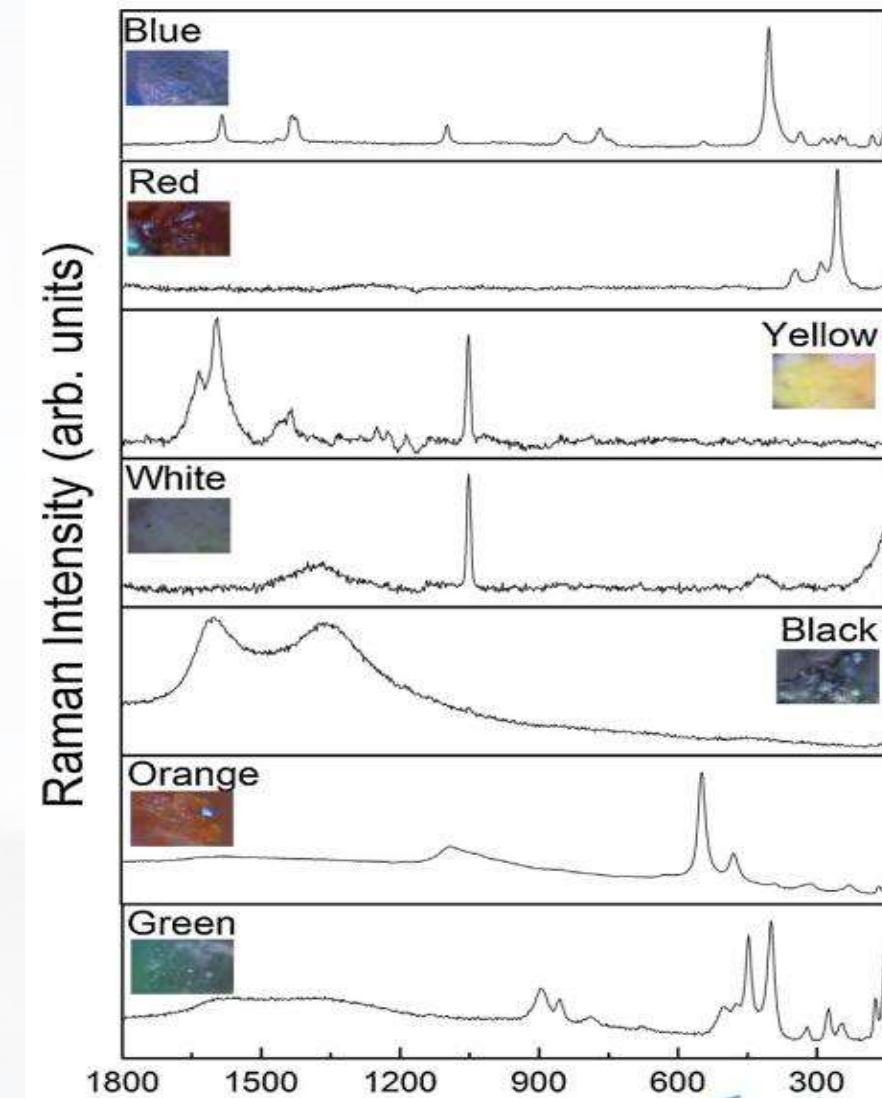


Raman spectroscopy shows that the spectrum of the new drug "Magu" is similar to that of caffeine, indicating that its main component is caffeine.



Archaeology & Cultural Heritage

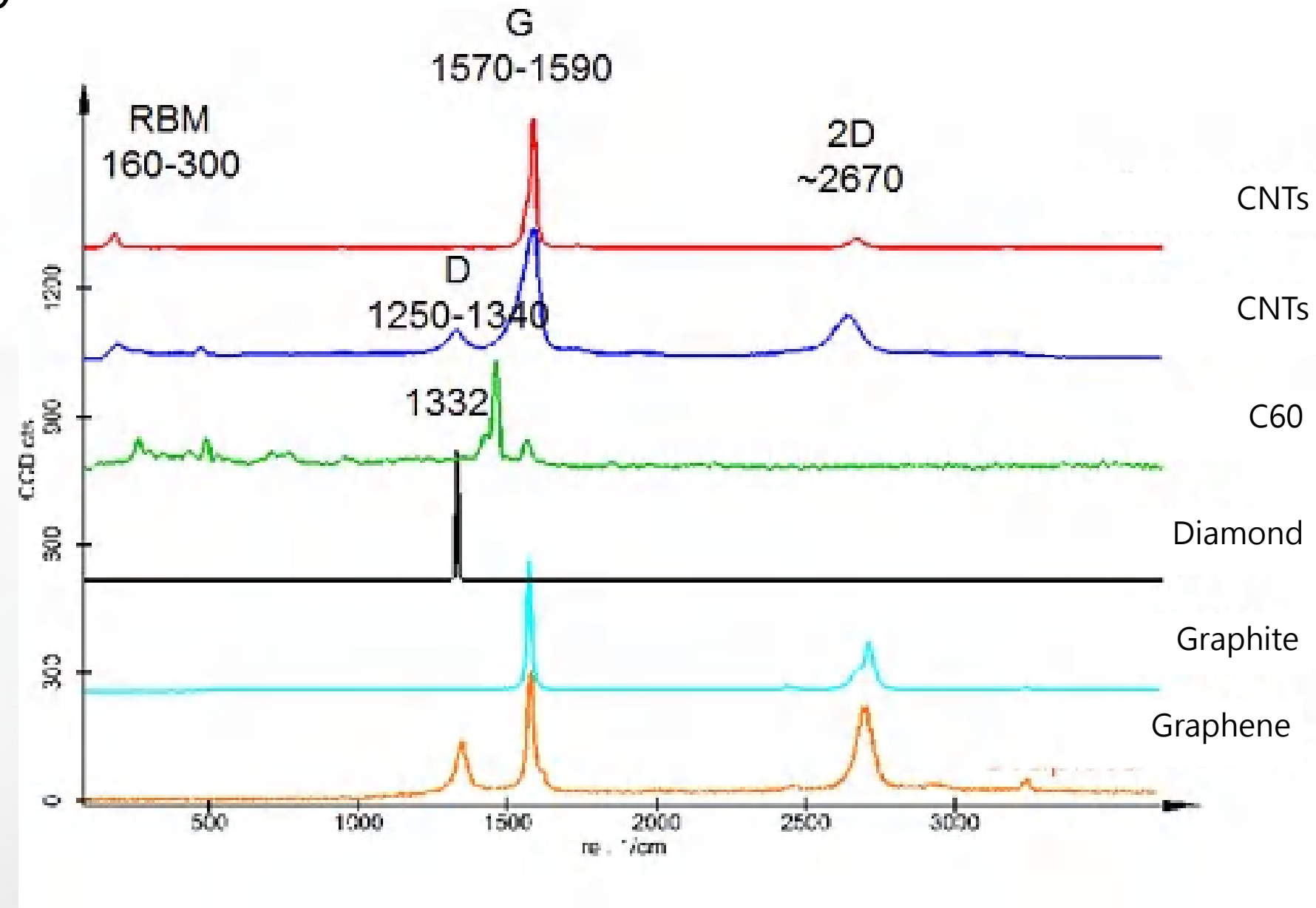
## Analysis of Dyes and Materials in Artifacts



- Provides a scientific basis for artifact valuation.
- Guides the color restoration of cultural relics.

# Application of EC-Raman

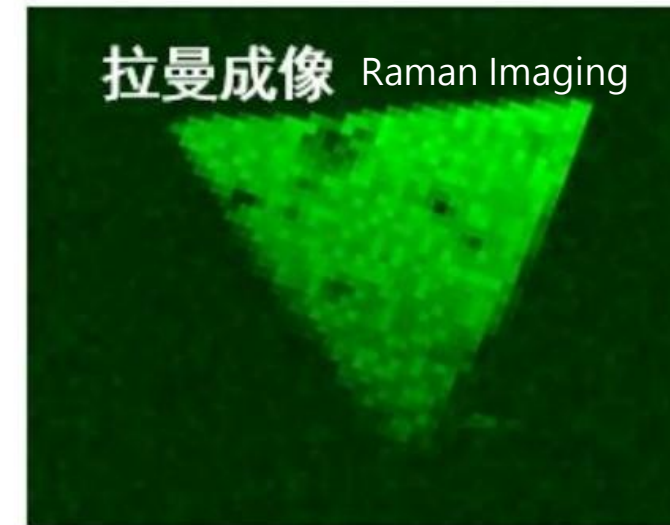
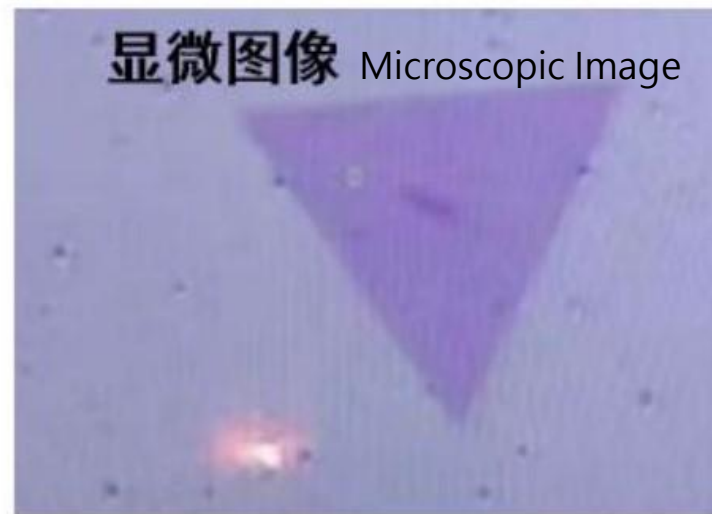
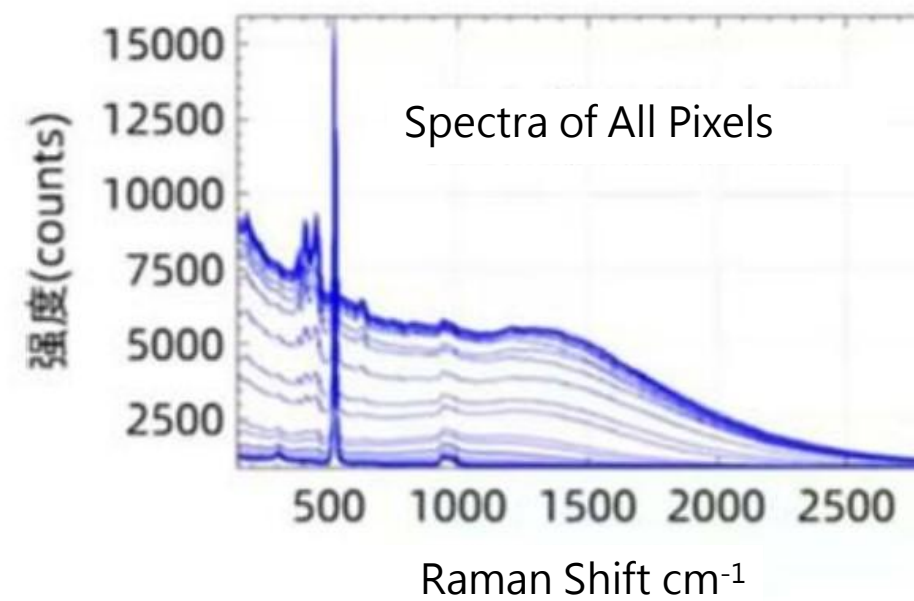
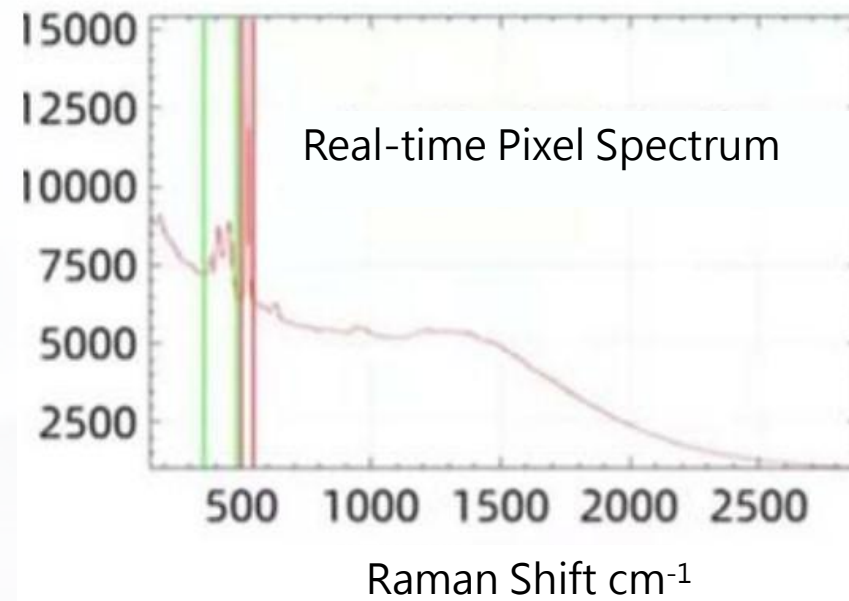
Chemical analysis of various materials.



Structural identification of carbon materials, defect analysis, determination of carbon nanotube diameter and chirality, and analysis of graphene layer numbers.

# Applications of Smart Raman

Material distribution of various samples by Raman imaging.

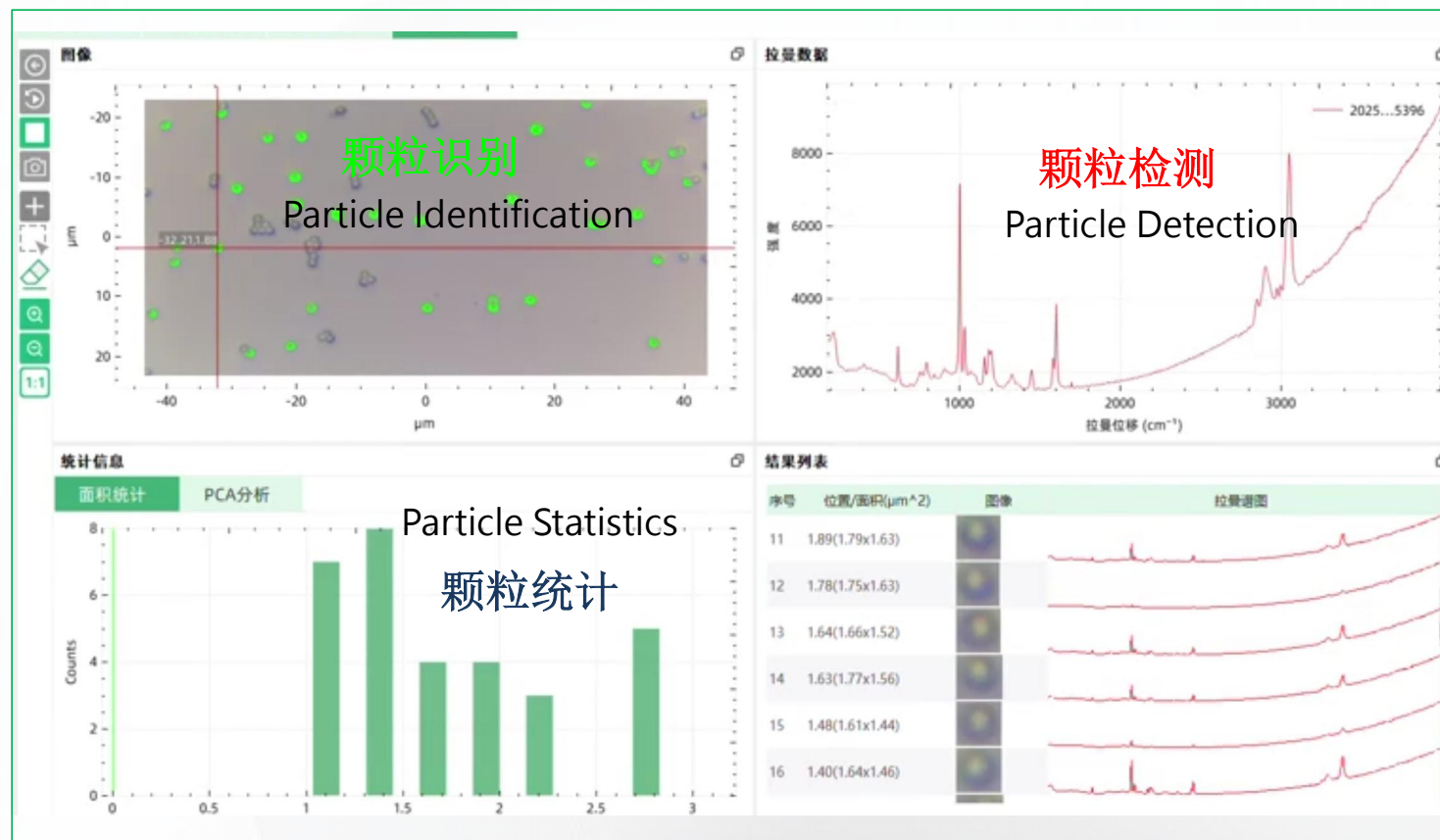


Enables visualization of 2D material distribution and defect mapping.

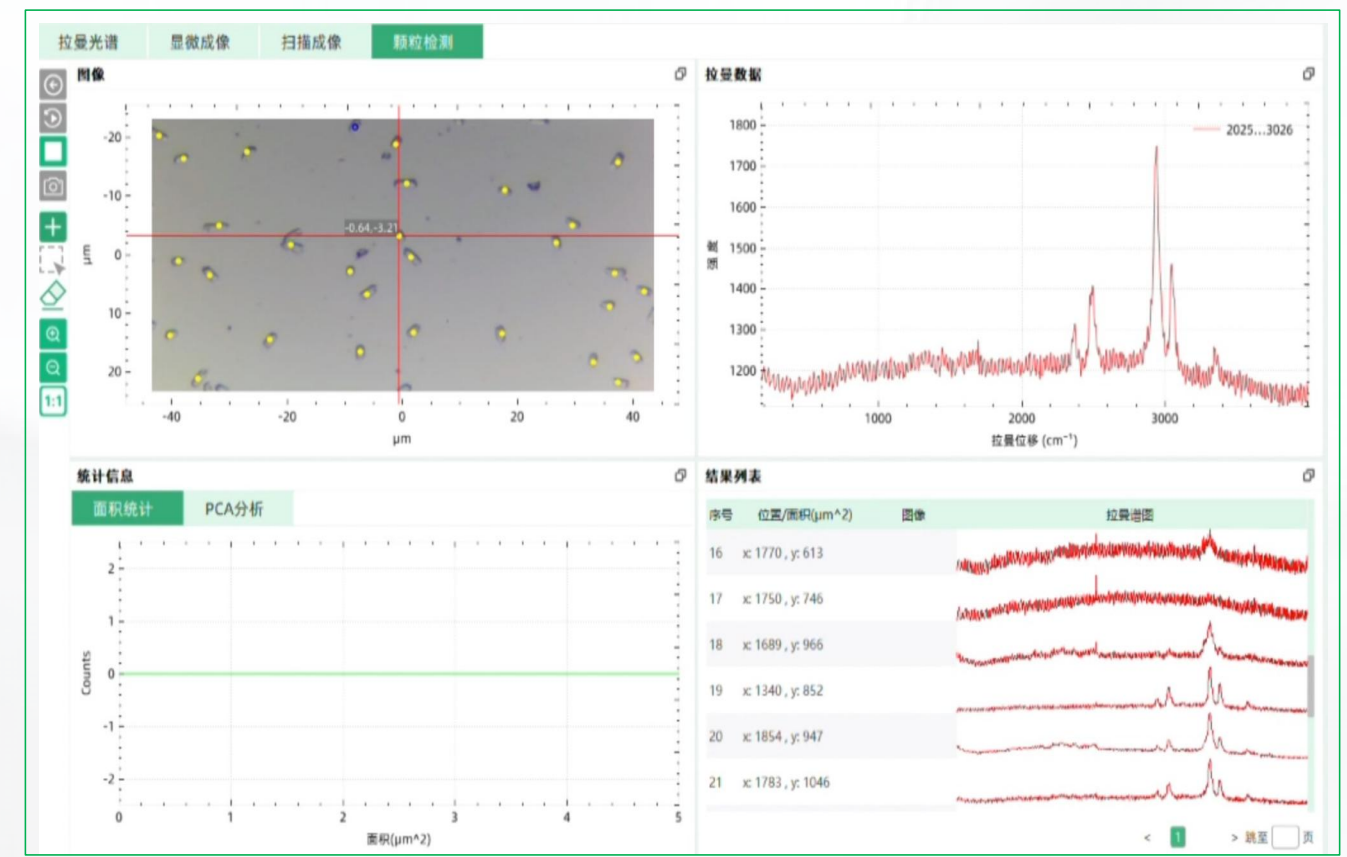
# Applications of Smart Raman

Automated Identification and Batch Analysis of Micron-Sized Particles

## Microplastics



## Single-Particle Bacterial Samples

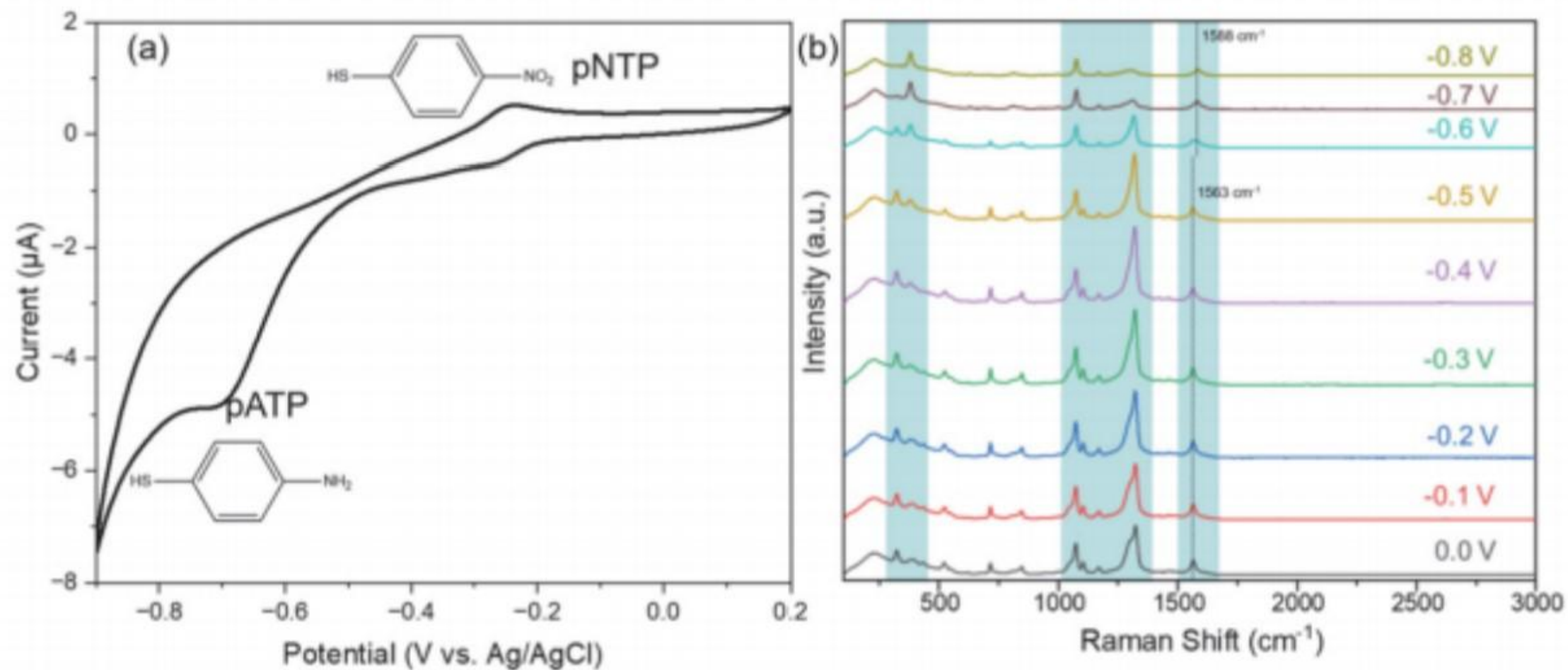


# Applications of EC-Raman

- Electrochemical System: Electrochemical Reduction of pNTP

The electrochemical catalytic reduction of pNTP (p-nitrothiophenol) on gold nanoparticles is a typical system for studying charge transfer and reaction kinetics.

Case: The reduction of pNTP to pATP (p-aminothiophenol). By combining potential control with real-time Raman spectroscopy, changes in the N=O stretching vibration are analyzed to monitor the reaction pathway.



# Applications of EC-Raman

- **Battery System: Anode Interfacial Reactions**

In situ electrochemical Raman spectroscopy combined with the potential step method is used to study interfacial reactions between the electrolyte and metal.

Case: Study of SEI formation in zinc batteries. Raman spectroscopy enables real-time monitoring of the formation and evolution of electrolyte decomposition products, providing experimental insights for interface optimization.

