Handheld Raman for Narcotics ID

Handheld Development and Challenges

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Metrohm Raman

Metrohm Raman

Based in Laramie, WY, USA

Acquired by Metrohm AG, headquartered in Herisau, Switzerland, in 2016

Over 60+ years total Raman experience company wide including systems development and applications

Many core members were part of a previous company that developed the first handheld Raman system in 2004

40+ employees total

Engineering R&D, On-site Manufacturing, Marketing

Always known as leading innovators in the Raman market!

- 15 patents

Medicine Bow Peak, Wyoming

Mobilization of Raman

2004 (post 911)

2004

2006

2010

2008

Feb 2011

Feb 2012

Feb 2014

Feb 2015

Jan 2017

Present

Handheld Raman development began following the 911 attack in the US. Development over the past 20 years has led to Raman instrumentation that is cell phone sized with massive innovation towards performance, sampling, data processing, and reporting

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Mira DS

Key requirements for Law Enforcement:

- Fast, accurate, non destructive identification of narcotics, starting materials, waste products
- Ruggedized for field use by non–technical users
- Simple data acquisition, processing and reporting

Mira DS Overview

- ORS sampling for increased measurement reproducibility
- On board automated data collection and processing
- Small form factor - 88.2 x 126.5 x 45.3 mm, 0.705 kg
- Flexible sampling attachments, including standoff for clandestine labs
- Sample collection through transparent packaging
- Mobile app for chain of evidence

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Use Case - Fentanyl

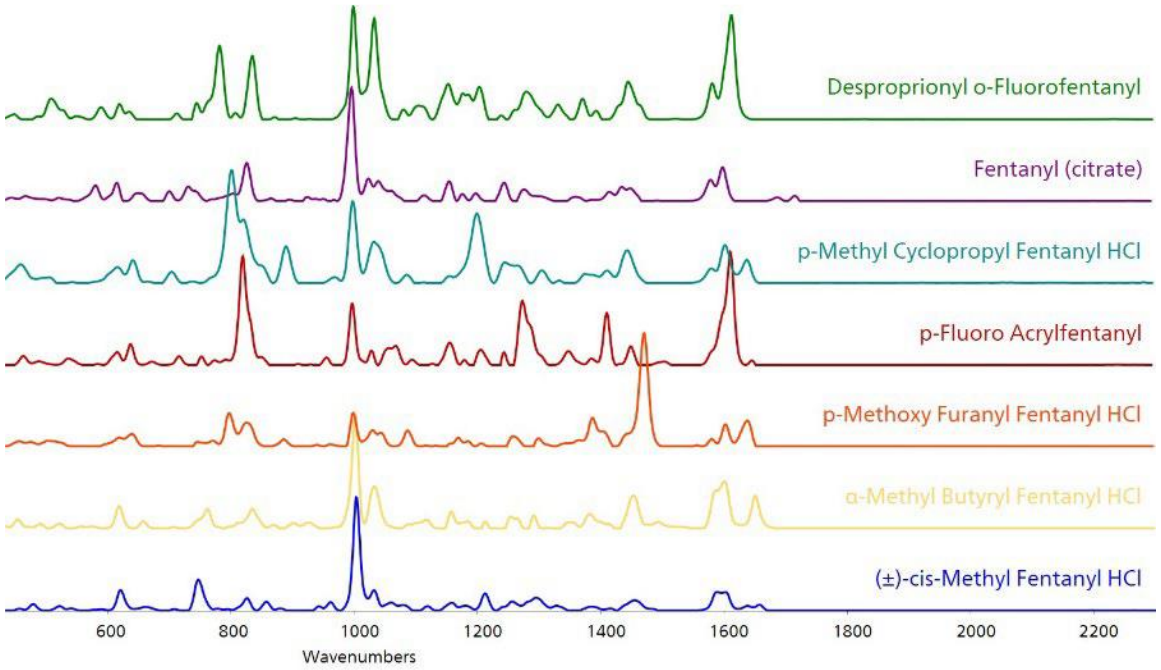
Fentanyl has been used for decades for treatment of severe pain

Similar euphoric high to heroin, less expensive to produce

- Presented either in bulk prior to cutting or often final product cut in low concentrations in heroin
- Heroin – DEA Schedule I, Fentanyl – DEA Schedule II

Fentanyl abuse and overdose has been steadily increasing over the past 10 years

Some fentanyl analogs are substantially more potent than others. Carfentanyl for example is 10,000x more potent than morphine!



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Use Case - Fentanyl

Challenges:

New drugs are being synthesized at an alarming rate to avoid ‘controlled’ listings

These drugs can be difficult to characterize due to outdated reference databases and structural similarity

Newly synthesized drugs may have severe unintended health consequences, both for users and law enforcement

Sampling – bulk identification is straight forward (through packaging), low concentration requires SERS

Solutions:

→ Government level control and restrictions (including general class restrictions). Partnerships between government agencies and technology manufacturers

→ Larger databases with more analogs is critical, but this will not alleviate issues related to structural similarities. New data processing is needed to better characterize classes and analogs

→ Raman’s inherent weak sensitivity can be overcome through the use of SERS. SERS research is very active and commercial solutions for narcotics and other materials are readily available and continue to improve

Questions?

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