

APPLICATION NOTE

HOUSEHOLD HAZARDOUS MATERIAL IDENTIFICATION USING HANDHELD 1064 nm RAMAN



- Analyze through containers
- Identify a wider range of substances
- Determine threat severity in seconds

Common materials found in homes and businesses have the potential of creating hazardous waste if not disposed of properly, especially when their containers break or leak (see Table 1). First responders have the need to identify these potentially hazardous materials immediately in order to correctly mitigate the potential threat to others.

Actionable Identification

Raman technology provides responders with a molecular fingerprint of substances and material identification. Raman spectroscopy is a nondestructive, non-contact method and can be used to analyze through glass, plastic bags and bottles, providing protection from potentially hazardous exposure.

The Rigaku CQL™ handheld series analyzers utilize a unique 1064 nm excitation laser. The 1064 nm advantage allows responders to detect the most comprehensive list of substances using a library of over 12,000 compounds – including cleaning, automotive, pesticide, or precursor materials as well as analyze colored substances or through colored containers (see Figures 1-4 as examples of potentially hazardous household chemicals).

Cleaning Products	Acids Degreasers
Automotive Products	Gasoline and diesel Oil and fluids
Lawn and Garden Products	Pesticides Fertilizers
Workshop/Painting Supplies	Halogenated hydrocarbons Alcohols
Flammable Products	Gasoline Starter fluids
Miscellaneous	Mystery products from decades past Formaldehyde DDT

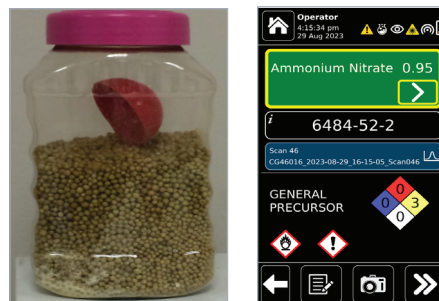
Table 1. The US Environmental Protection Agency (USEPA) has grouped their list of hundreds of potential chemicals into these categories

Conclusion

Accurate identification of unknown household chemicals can assist first responders to quickly and safely mitigate dangerous situations and also facilitate the correct disposal process for the hazard. Rigaku’s unique 1064 nm laser technology facilitates the identification of hazardous chemicals which are often found in residential environments. Using an onboard library containing over 12,000 chemicals for reference, virtually any unknown chemical can be identified within seconds using safe, non-contact sampling.



Figures 1 and 2. Analysis of gasoline through colored glass using a Rigaku CQL handheld analyzer.



Figures 3 and 4. Analysis of ammonium nitrate through plastic container using a Rigaku CQL handheld analyzer.



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