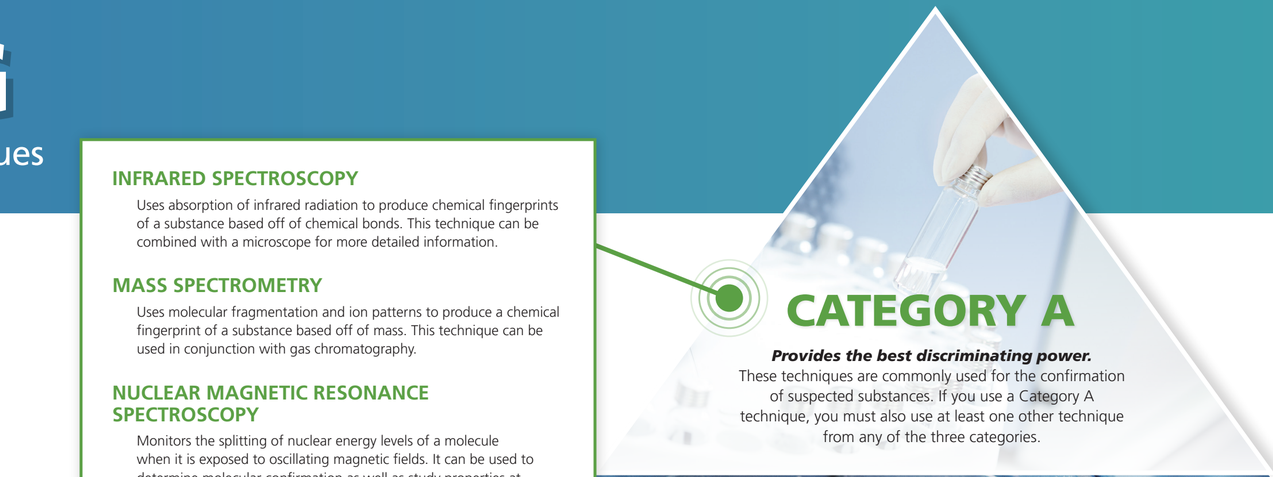
SWGDRUG

Categories of Analytical Techniques

The Scientific Working Group for the Analysis of Seized Drugs (SWGDRUG) requires the use of multiple identification techniques when analyzing drug samples. These techniques are divided into three categories based on their discriminating power.

This reference poster highlights the differences between the three categories and the techniques. (Please reference SWGDRUG recommendations Version 7.1 Part IIIB for more details at ***www.swgdrug.org***)

To learn more about how you can optimize your forensic analysis, visit www.InvestigateYourLab.com



CATEGORY A

Provides the best discriminating power. These techniques are commonly used for the confirmation of suspected substances. If you use a Category A technique, you must also use at least one other technique from any of the three categories.

INFRARED SPECTROSCOPY

Uses absorption of infrared radiation to produce chemical fingerprints of a substance based off of chemical bonds. This technique can be combined with a microscope for more detailed information.

MASS SPECTROMETRY

Uses molecular fragmentation and ion patterns to produce a chemical fingerprint of a substance based off of mass. This technique can be used in conjunction with gas chromatography.

NUCLEAR MAGNETIC RESONANCE SPECTROSCOPY

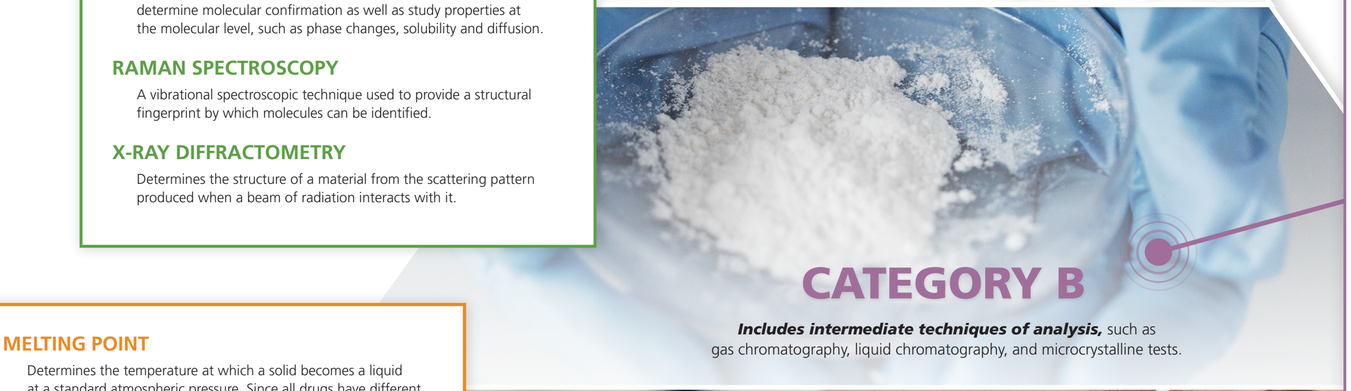
Monitors the splitting of nuclear energy levels of a molecule when it is exposed to oscillating magnetic fields. It can be used to determine molecular confirmation as well as study properties at the molecular level, such as phase changes, solubility and diffusion.

RAMAN SPECTROSCOPY

A vibrational spectroscopic technique used to provide a structural fingerprint by which molecules can be identified.

X-RAY DIFFRACTOMETRY

Determines the structure of a material from the scattering pattern produced when a beam of radiation interacts with it.



CATEGORY B

Includes intermediate techniques of analysis, such as gas chromatography, liquid chromatography, and microcrystalline tests.

CAPILLARY ELECTROPHORESIS

Enables separation of a variety of molecules—from small inorganic ions to huge biopolymers—through the use of buffer-filled, narrow-bore capillary columns.

GAS CHROMATOGRAPHY

Separates complex mixtures based upon differences in boiling point/vapor pressure. Refers to any chromatographic procedure where the mobile phase is a carrier gas.

ION MOBILITY SPECTROMETRY

Separates and identifies ionized molecules in the gas phase based on their mobility in a carrier buffer gas.

LIQUID CHROMATOGRAPHY

Used to separate ions and molecules in complex mixtures based upon differences in polarity. Refers to any chromatographic procedure where the moving phase is a liquid.

MICROCRYSTALLINE TESTS

Uses the microscopic crystals produced by chemical reactions to identify the substance being tested. In many cases, a series of positive microcrystalline tests is considered a conclusive test.

PHARMACEUTICAL IDENTIFIERS

Determines the identity, manufacturer or quantity of substances present based on the physical characteristics of tablets, capsules or packaging.

THIN LAYER CHROMATOGRAPHY

Uses solvents traveling through a porous medium to separate compounds by their chemical reactivity. Can be documented through photographing or photocopying the developed thin-layer plate.

CATEGORY C

Has the lowest discriminating power. These techniques are often used to screen for the presence of drugs and are combined with Category A and B techniques.

COLOR TESTS

Uses the colors produced by chemical reactions to presumptively identify a class of compounds.

FLUORESCENCE SPECTROSCOPY

Identifies a compound based on its fluorescent properties. This technique can be used to measure both an excitation spectrum (the light that is absorbed by the sample to result in fluorescence emission) and/or an emission spectrum (the fluorescent light emitted from the sample).

IMMUNOASSAY

Uses an antibody or antigen to measure the presence or concentration of a macromolecule or small molecule in a sample.

MELTING POINT

Determines the temperature at which a solid becomes a liquid at a standard atmospheric pressure. Since all drugs have different melting points, this type of analysis is useful in identifying illegal substances.

ULTRAVIOLET/VISIBLE SPECTROSCOPY

Measures the absorption of light in the ultraviolet-visible spectral region. This technique is often used as a preliminary test to identify unknown compounds for further testing.

CANNABIS ONLY

MACROSCOPIC EXAMINATION

A physical identification process of the plant material to determine if the sample has the class and morphological characteristics of cannabis.

MICROSCOPIC EXAMINATION

Observing the plant under magnification in order to identify characteristics that are unique to cannabis.

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