

Prescription For Crime

Drug Testing and Analysis



The Mystery of
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VXH-LL-DRT

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Drug use in the USA

- In 2010, 22.6 million Americans 12 or older (8.9 % of the population) were current illicit drug users. This was an increase over previous years, mostly due to more marijuana use.
- Drug overdoses and brain damage linked to long-term drug abuse killed an estimated 37,485 people in 2009, surpassing the toll of traffic accidents by 1,201.
- Many of these fatalities were due to prescription drug abuse.

Source: http://www.cdc.gov/nchs/data/nvsr/nvsr59/nvsr59_04.pdf

Presumptive Drug Tests

- Police officers use rapid **presumptive tests** to determine whether drugs are present.
- These are simple color tests adaptable to field use to identify controlled substances.
- Along with other circumstantial facts, physical appearance, odor, texture, etc., they help the police officer form the probable cause to support their suspicion that the unknown substance is controlled.
- Presumptive tests may generate false positives. If a presumptive test generates a positive result a more complex **confirmatory test** is administered.

Confirmatory Testing

- The analysis of controlled substances is a forensic science discipline with a strong scientific foundation.
- The analytical methods used have been adopted from classical analytical chemistry, and there is broad agreement nationwide about best practices.
- In 1997, the Scientific Working Group for the Analysis of Seized Drugs (SWGDRUG) was established.
- The mission of SWGDRUG is to recommend minimum standards for the forensic examination of seized drugs and to seek international acceptance for those standards. <http://www.swgdrug.org/>

Alcohol Absorption and Evaporation

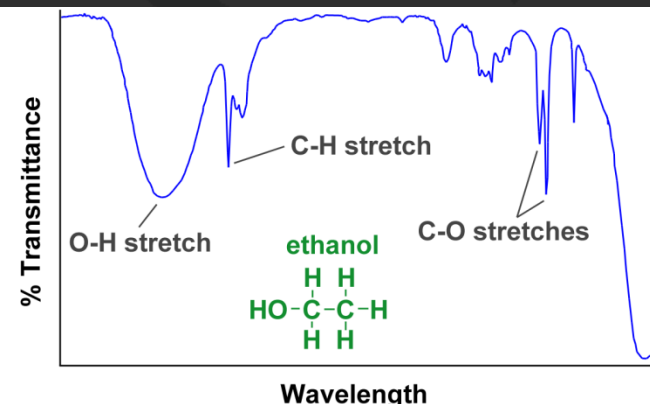
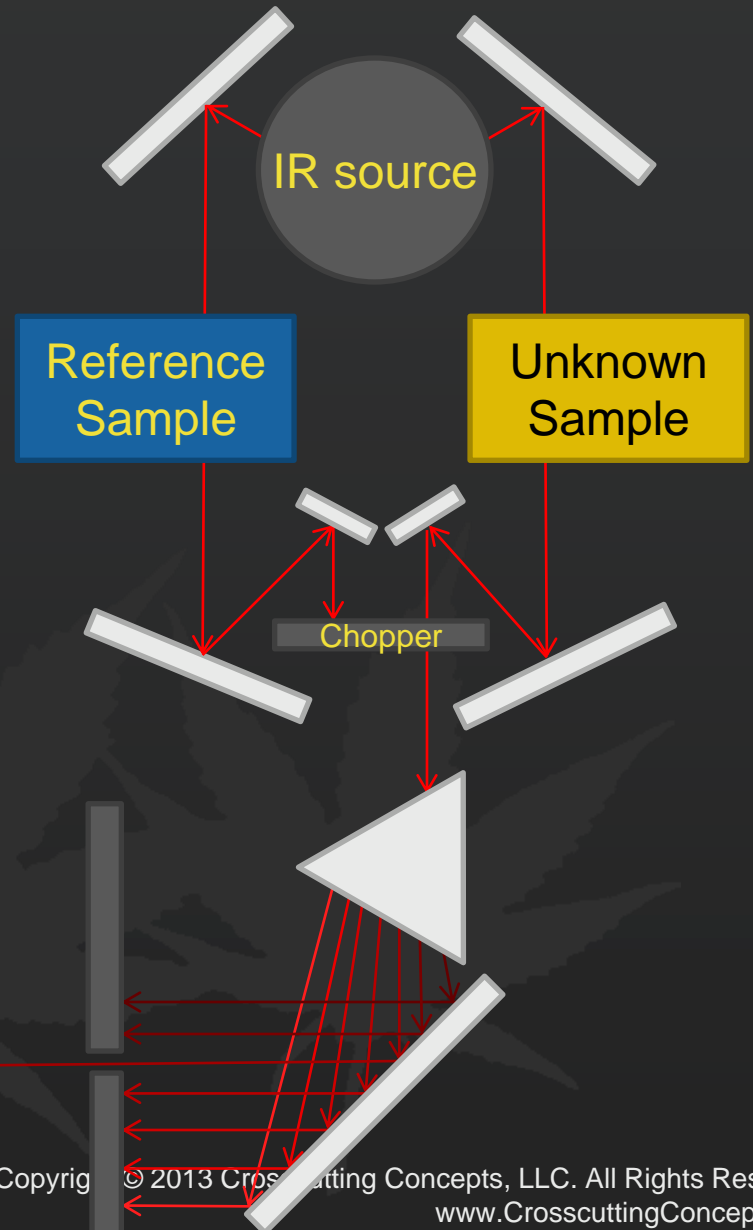
- Alcohol gets absorbed from the stomach and intestines into the bloodstream.
- Alcohol is not chemically changed in the bloodstream.
- As the blood goes through the lungs, some of the alcohol moves across the membranes of the lung's air sacs into the air, because alcohol will evaporate from a solution.
- The concentration of the alcohol in the lungs is related to the concentration of the alcohol in the blood with a ratio of 1 to 2100.
- It can be detected by breath alcohol testing devices, such as a Breathalyzer.

Types of Testing Devices

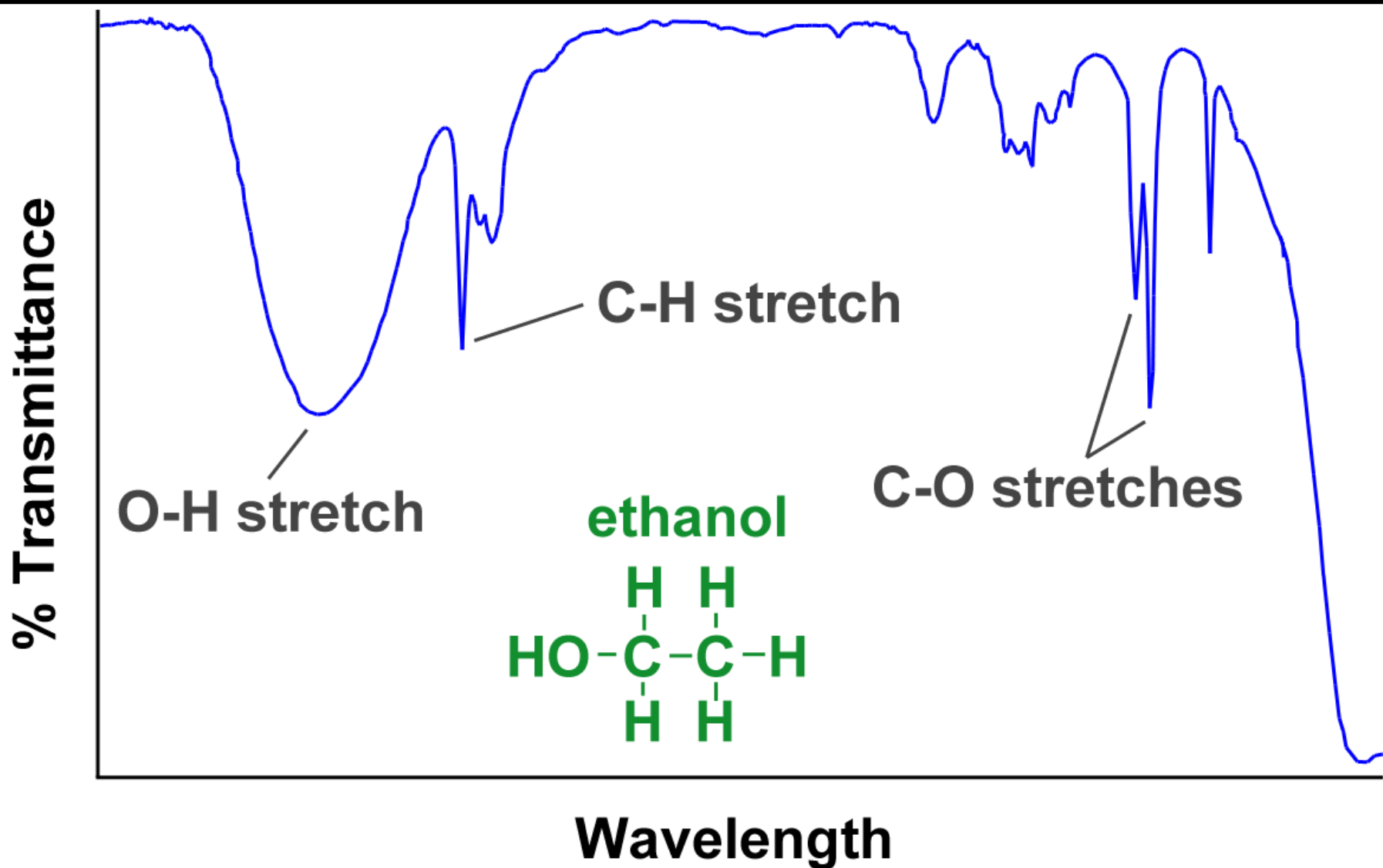
- Two breath testing technologies are most prevalent.
- Desktop analyzers generally use infrared spectrophotometer technology, electrochemical fuel cell technology, or a combination of the two.
- Hand-held field testing devices are generally based on electrochemical platinum fuel cell analysis and, depending upon jurisdiction, may be used by officers in the field as a form of "field sobriety test" or as evidential devices in point of arrest testing.

Infrared Spectroscopy

When every wavelength has been absorbed from both samples they are plotted against each other for identification.



Ethanol Spectral Analysis



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