



B91 Practical Identity Using Microcrystal Tests

Wayne Moorehead, MS*, Orange County Sheriff-Coroner, 320 North Flower Street, Santa Ana, CA 92703

After attending this presentation, attendees will learn the role of microcrystal tests in analytical schemes and their usefulness in criminalistics.

This presentation will impact the forensic community and/or humanity by reviewing of some aspects of the essence of criminalistics and suggestions for increasing the visibility of this useful method of analysis.

Most forensic scientists with a modicum of interest in forensic science when asked for the definition of their profession will be able to state that it is the application of science toward civil and criminal law matters. Ask them to describe the core principles of criminalistics and, for many, silence results. Near the hub of the profession of criminalistics resides the practical identity of evidence.

To the criminalist identity has two meanings – to make an identification and to make an individualization. The evidence determines which of the two or if both concepts are to be pursued. Criminalistics is the science of individualization – the pointing to or identity of one object or person to the exclusion of all other objects or people. Often the criminalist must identify the evidence before individualizing it to a unique person, place, or thing. In criminalistics, making an identification of an unknown substance is not unlike other sciences. When the criminalist has an unknown powder suspected of being a drug, an identification of the drug is made by matching the properties of the questioned drug to a known drug having the same properties. Microcrystal tests have been a part of the practical identity of routine controlled substance analyses for many decades as well as for unknown substances in trace evidence analysis.

There are two types of science in practice. The first type is theoretical. The development of new materials and technology requires determining structure and properties, and exemplifies what the public perceives as science. This science identifies never before identified chemicals through structural elucidation by using an array of instrumentation and methods. This type of identification, that of identifying a “true unknown” with a variety of instrumental methods, never occurs in forensic science. The second type of science involves the practical identification or comparative analysis of materials. A comparison of the unknown against a database of known standards is conducted. The standards may be in the form of spectra or the results of chemical reactions called microcrystal tests. The comparison of a microcrystal test result from a questioned sample to a known drug standard is equivalent to the common practice of comparing the infrared or mass spectrum of a questioned sample to a known drug standard. The inclusion of microcrystal tests as the confirmatory tests of an analytical scheme for common controlled substances results in the practical identity of the drug, providing a savings of time per case, and greater case output with no reduction in the quality of the analyses. All scientists, whether from outside the field of criminalistics or from within, must understand the role of microcrystal tests for common drugs of abuse: that of being the last part of a scheme of analysis. For unknowns in trace evidence, the microcrystal tests are used in conjunction with optical properties or other microscopical or instrumental methods. In order to improve the visibility of microcrystal tests some suggestions are offered.

- 1) Give presentation on microcrystal tests at large venue scientific meetings
- 2) Publish papers in widely read and respected scientific journals
- 3) Respond to misleading and misinformed articles on color spot tests and microcrystal tests
- 4) Do not use an article as a reference that is misleading or misinformed
- 5) Emphasize the benefit of microcrystal tests for teaching qualitative analysis in inorganic and organic chemistry – e.g., limited amounts of material and safety to students
- 6) Encourage other scientists to use microscopy and microcrystal tests
- 7) Join scientific organizations to provide correct information on the use, value, and limitations of microcrystal tests.

Drugs, Microcrystal Test, Identification