Standard Practice for Microcrystal Testing in Forensic Analysis for Phencyclidine and Its Analogues

WHAT IS AN AAFS STANDARD FACTSHEET?

The AAFS produces clear, concise, and easy to understand factsheets to summarize the contents of technical and professional forensic science standards on the OSAC Registry. They are not intended to provide an interpretation for any portion of a published standard.

WHAT IS THE PURPOSE OF THIS STANDARD?

Microcrystal tests are one of several techniques that may be incorporated into the overall analytical scheme for seized drug analysis. This is described in ASTM E2329-17 (Standard Practice for Identification of Seized Drugs).

Microcrystal tests are primarily chemical-precipitation tests employing the use of a light microscope to distinguish between the crystals that are formed. The analysis conducted can be applied to a small amount of test material and may be utilized during the examination of seized drugs.

This standard describes the requirements for microcrystal tests for the analysis of phencyclidine (PCP) and its analogues (i.e., closely related compounds within the same structural family). It is intended for the analysis of solid or liquid (injectable) forms of the drug, not biological samples.

WHY IS THIS STANDARD IMPORTANT? WHAT ARE ITS BENEFITS?

Adherence to these minimum standards establishes consistency between laboratories, improves efficiency of laboratory resources, and encourages general acceptance of microcrystal testing for the analysis of PCP and its analogues.

It provides direction to the forensic drug analyst community regarding the use of microcrystal tests for the analysis of these substances.

Forensic seized drug laboratories are encouraged to meet these minimum standards.

HOW IS THIS STANDARD USED AND WHAT ARE THE KEY ELEMENTS?

Minimum equipment and procedures for microcrystal analysis of PCP and its analogues using potassium permanganate, gold bromide, or gold chloride are described in this standard. These tests require skill and expertise to perform. The appropriate precipitating reagent is added to a small amount of test material (approximately 1 mg). The habit (i.e., external morphology or shape) and aggregation of the crystals formed can be used to distinguish PCP or its analogues from other drugs. A polarized light microscope (PLM), capable of magnifications of 40x to 400x is recommended. If the crystal morphology observed is similar to those formed using known reference standards, the sample is considered positive by this technique for the presence of PCP or its analogies. Microcrystal tests are classified as Category B tests under ASTM E2329-17, which means that additional testing is required.

The equipment, reagents, procedure, and interpretation of results are specified in this standard. Performance verification, and potential interferences from diluents and adulterants (that may be added to seized drug material) are also addressed. The best practice for documenting the crystal formation results is to take a digital photograph.

This is a practice standard, which means that additional procedural steps beyond those required in the standard may be necessary. Laboratories or forensic science service providers that are unable to meet the standards may use external resources to meet the requirements (e.g., outsourcing, partnerships).

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