



Standard Guide for Microcrystal Testing in the Forensic Analysis of Phencyclidine and Its Analogues¹

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INTRODUCTION

Microcrystal tests are primarily chemical-precipitation tests in which a light microscope is used to observe and distinguish the different types of crystals formed. These tests require skill and expertise on the part of the analyst that can be adequately gained only through appropriate training and experience in their use. These tests should not be attempted by those who are unfamiliar with them for use in the analysis of phencyclidine and its analogues.

1. Scope

1.1 This guide describes some standard procedures applicable to the analysis of phencyclidine and its analogues using microcrystal tests.

1.2 These procedures are applicable to phencyclidine and its analogues which are present in solid dosage form or in a liquid form. They are not typically applicable to the analysis of phencyclidine and its analogues in biological samples.

2. Terminology

2.1 Definitions:

2.1.1 *aggregation*—the collecting of units or parts into a mass or whole.

2.1.2 *birefringence*—property of some crystals having more than one refractive index. This will result in interference colors which are viewed through a polarized light microscope.

2.1.3 *habit*—the external morphology of the crystal.

2.1.4 *microdrop*—a small drop of liquid that would fit on the end of a standard size, flattened toothpick. The approximate volume of this drop would be 10 to 25 microliters.

2.1.5 *nails*—a skeleton of some kinds of triangles, elongated, usually pointed with a short head usually thicker or broader.

2.1.6 *needles (acicular)*—long, thin crystals with pointed ends.

2.1.7 *nuggets*—irregularly formed grains without sharp faces or edges.

2.1.8 *pliers*—crystals resembling pliers, generally X-shaped.

2.1.9 *razor blades*—thin oblong crystals with length about twice the width, resembling a safety razor blade.

2.1.10 *sheaves*—elongated crystals form two opposite fans

from the same joining point.

2.1.11 *skeletal crystal*—a crystal in which all of the spaces in the crystal lattice are not occupied.

2.1.12 *spindles*—shorter than coarse needles, but more substantial cross-section.

3. Summary of the Technique

3.1 A small sample of the material containing the suspected phencyclidine or its analogues is dissolved in a dilute acid and the appropriate precipitating reagent is added. The crystals that are formed are observed and distinguished utilizing a light microscope.

4. Significance and Use

4.1 The technique produces a chemical-precipitation reaction between the phencyclidine or its analogues and the precipitating reagent. The habit and the aggregation of the crystals formed may be used to distinguish phencyclidine or its analogues from other drugs.

4.2 The technique can be utilized on phencyclidine or its analogues present in either the salt or free base form.

4.3 The technique does not distinguish between salt and free base forms.

5. Interferences

5.1 Diluents/adulterants present in combination with phencyclidine or its analogues in the sample to be tested may result in crystals that are distorted or otherwise rendered unidentifiable. In these instances, it will be necessary to separate the phencyclidine or its analogues from the diluents/adulterants or to use other testing methods to analyze for phencyclidine or its analogues.

6. Apparatus

6.1 Standard light microscope capable of varying magnifications including 100× is needed for viewing the crystals.

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