



# **TENNESSEE BUREAU OF INVESTIGATION**

## *Forensic Services Division*

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### Forensic Chemistry Standard Operating Procedure Manual

#### Lysergic acid diethylamide (LSD)

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## **30.0 LSD IDENTIFICATION**

### **30.1 Background**

Lysergic acid diethylamide (LSD) is a strong hallucinogenic compound that is routinely synthesized in liquid form then applied to other ingestible objects for administration. LSD is readily absorbed through the skin, therefore latex/nitrile gloves will be used while handling suspected samples.

### **30.2 Testing Procedures**

#### *30.2.1 Extractions*

LSD exhibits fluorescence in the presence of ultraviolet light. The analyst can utilize this property to determine where a possible LSD sample may be placed on different media for further extraction. Care must be taken to ensure that the media doesn't fluoresce, and that any dyes present do not interfere with the color test.

A methanol extraction works to isolate LSD from most mediums and can be run directly on the GC-MS. If the medium is a gelatin matrix, an extended soak (up to 30 minutes) may be needed to ensure proper extraction.

An alternative method is to extract a portion of the sample into an aliquot of 1% tartaric or 2% citric acid, followed by making it basic with sodium bicarbonate or sodium carbonate and extracting it into a small volume of chloroform. The chloroform layer may then be analyzed using the GC-MS.

Use glassware for all extractions and sample preparation.

#### *30.2.2 Presumptive Testing*

A sample can be treated with the p-DMAB color reagent using concentrated HCl as a catalyst. A positive result will turn purple in the presence of LSD.

TLC may be performed on an extracted sample of the suspected LSD. Spot the extract along with a standard LSD sample onto a thin-layer plate and develop it in a TLC tank using a 9:1 chloroform and methanol system or an 18:1 ammonium saturated chloroform and methanol system. Spray the plate with PDMAB reagent. A positive result is indicated by a development of a purple spot at the same distance traveled on the plate as the LSD standard spot.

UV spectrophotometry can also be utilized for a presumptive test of LSD. Because of the low active dosages for LSD, extraction volumes should be kept to a minimum.

GC retention times may also be utilized as presumptive test.



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If the sample doesn't appear to contain LSD based on presumptive tests, the analyst will screen for other possible psychoactive compounds. In recent years, a national trend has shown the use of blotter papers for new synthetic compounds.

#### *30.2.3 Confirmatory Testing*

While LSD exhibits an infrared spectrum, the predominant method of confirmation is via GC-MS. An FTIR examination may be performed on the evaporated  $\text{CHCl}_3$  extract using either a KBr pellet or ATR sampling accessory.

#### **30.3 References**

Basic Training Program for Forensic Chemists, U.S. Department of Justice, Drug Enforcement Administration, Washington, D.C. 2007

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*Analysis of Drugs*, U.S. Department of Justice, "LSD", 1974, pp. 63-67.