



# TENNESSEE BUREAU OF INVESTIGATION

## Forensic Services Division

---

### Forensic Chemistry Standard Operating Procedure Manual

#### Synthetic Cannabinoids, Bath Salts, and Analogues

---

## 33.0 SYNTHETIC CANNABINOIDS, BATH SALTS, AND ANALOGUES

### 33.1 Background

Synthetic cannabinoids are compounds added to various matrices that can act similarly to THC in the human body. Bath salts are compounds that are often derivatives of methcathinone and may be submitted as powders or crystalline substances. These compounds are often extremely potent compared to their aforementioned counterparts. Extra care should be taken during analysis to prevent exposure to these substances.

These compounds exhibit a wide variety of base structures, solubilities, response to analytical instrumentation, and legal standing. See TCA §39-17-438 and TCA §39-17-452 for further information.

### 33.2 Testing Procedures

#### 33.2.1 Synthetic Cannabinoids

UV-VIS, GC-FID, FTIR, GC-MS, and GC-IR are possible routes for analysis for powders and crystalline substances.

GC-FID, GC-MS, and GC-IR are likely routes for analysis for plant materials and other ingestible items. Vortexing the sample in a test tube with enough solvent to cover it is typically sufficient to extract the compound.

Please note that interfering compounds from the matrix, multiple compounds of interest, co-elution of compounds, and varying concentrations of compounds may create analytical difficulties. Multiple extractions and instrumental methods may be required for complete analysis. Some types of these compounds require the use of longer methods on some instruments due to their high molecular weight.

#### 33.2.2 Bath Salts

Presumptive testing can include a Marquis color test, UV-VIS, and GC-FID.

Confirmatory testing will require GC-MS, GC-IR, FTIR, or a combination of these techniques. Bath salts typically have low molecular weights, so choosing a low temperature separation method may be advisable.

### 33.3 Special Considerations

Due to the constant emergence of new compounds, analogues, and derivatives, consult the unit supervisor or the TBI FCU Technical Leader when an unknown compound is encountered that is similar to known synthetic compounds.

Isomeric form determinations may not be possible due to the instrumentation used. The remark *Isomeric form not determined* should be included on the report if necessary.