Name of Procedure:
Thin-Layer Chromatography
9:1 Developing Solvent

Suggested Uses:
The 9:1 Thin-Layer Chromatography Developing Solvent is used to separate and identify organic compounds. Uses of this TLC solvent include opium alkaloids, ergot alkaloids, synthetic opiates, coca alkaloids and other acidic, basic, and neutral organic compounds and drugs.

Apparatus Needed to Perform Procedure Including Preparation of Reagent:
Thin-Layer Chromatography Plates
   Silica gel GF - fluorescent indicator
   Thickness: 250 microns
Developing tank
Micro pipets
UV light (long and short wave)
Fume hood
Gloves
Eye protection
Laboratory coat
Graduated cylinders
Reagent bottle
Funnel
Porcelain spot plate
Spatula
Chloroform
Methanol

Formula for Preparing Reagent:
1. Measure out 90 milliliters of chloroform and 10 milliliters of methanol.
2. Pour measured solvents into reagent bottle and mix well.

Formula for Preparing Reagent (continued):

3. Properly label reagent bottle.

Quality Control Check:

A quality control check of this reagent will be performed using a known standard of heroin and following the application procedure listed below.

Expiration Date of Chemical Reagent:

The solvent can be used until depletion provided it is stored in an airtight reagent bottle.

Application of Procedure on Evidence:

1. A sample of the unknown (approximately 1-2 milligrams) is placed in the well of a porcelain spot plate and several drops of a suitable solvent are added to dissolve the sample.

2. A known standard (approximately 1-2 milligrams) is also dissolved in the well of a spot plate with several drops of a suitable solvent. (Known standard is selected after visual observation and/or a series of preliminary tests).

3. With a capillary pipet, several microliters of the unknown and standard solutions are placed side by side approximately 5 millimeters from the bottom of the TLC plate.

4. Add 9:1 solvent to the developing tank to a depth of approximately 2 millimeters and allow several minutes for atmosphere to equilibrate.

5. Allow all the spotting solvent to evaporate from the TLC plate.

6. Place the TLC plate in the developing tank and close the lid.
7. Allow the TLC plate to develop to the top of the plate.

Application of Procedure on Evidence (continued):

8. Remove the TLC plate from the developing tank and allow the solvent to dry.

9. Visualize with UV light or an appropriate visualizing reagent.

10. Record results.

Safety Concerns:

Always wear eye protection, gloves and a laboratory coat when preparing this TLC solvent.

Literature References:


This procedure has been used in the Drug Chemistry Section since 1971.
Name of Procedure:
Thin-Layer Chromatography
2:1 Developing Solvent

Suggested Uses:
The 2:1 Thin-Layer Chromatography Developing Solvent is used to separate and identify organic compounds. Suggested uses of this TLC solvent include ergot alkaloids and other organic compounds.

Apparatus Needed to Perform Procedure Including Preparation of Reagent:
Thin-Layer Chromatography Plates
   Silica gel GF - fluorescent indicator
   Thickness: 250 microns
Developing tank
Micro pipets
UV light (long and short wave)
Fume hood
Gloves
Eye protection
Laboratory coat
Graduated cylinders
Reagent bottle
Funnel
Porcelain spot plate
Spatula
Acetone
Chloroform

Formula for Preparing Reagent:
1. Measure out 20 milliliters of acetone and 10 milliliters of chloroform.
2. Pour measured solvents into reagent bottle and mix well.
3. Properly label reagent bottle.

Quality Control Check:

A quality control check of this reagent will be performed using a known standard of LSD and following the application procedure listed below.

Expiration Date of Chemical Reagent:

The solvent can be used until depletion provided it is stored in an airtight reagent bottle.

Application of Procedure on Evidence:

1. A sample of the unknown (approximately 1-2 milligrams) is placed in the well of a porcelain spot plate and several drops of a suitable solvent are added to dissolve sample.

2. A known standard (approximately 1-2 milligrams) is also dissolved in the well of a spot plate with several drops of a suitable solvent. (Known standard is selected after visual observation and/or a series of preliminary tests).

3. With a capillary pipet, several microliters of the unknown and standards solutions are placed side by side approximately 5 millimeters from the bottom of the TLC plate.

4. Add 2:1 solvent to the developing tank to a depth of approximately 2 millimeters and allow several minutes for atmosphere to equilibrate.

5. Allow all the spotting solvent to evaporate from the TLC plate.

6. Place the TLC plate in the developing tank and close the lid.

7. Allow the TLC plate to develop to the top of the plate.
8. Remove the TLC plate from the developing tank and allow the solvent to dry.

9. Visualize with UV light or an appropriate visualizing reagent.

10. Record results.

**Safety Concerns:**

Always wear eye protection, gloves and a laboratory coat when preparing this TLC solvent.

**Literature References:**


This procedure has been used in the Drug Chemistry Section since 1971.
**Name of Procedure:**

Thin-Layer Chromatography
4:1 Developing Solvent

**Suggested Uses:**

The 4:1 Thin-Layer Chromatography Developing Solvent is used to separate and identify organic compounds. Suggested uses of this TLC solvent are the cannabinooids found in marijuana.

**Apparatus Needed to Perform Procedure Including Preparation of Reagent:**

Thin-Layer Chromatography Plates  
Silica gel GF - fluorescent indicator  
Thickness: 250 microns  
Developing tank  
Micro pipets  
UV light (long and short wave)  
Fume hood  
Gloves  
Eye protection  
Laboratory coat  
Graduated cylinders  
Reagent bottle  
Funnel  
Porcelain spot plate  
Spatula  
Ethyl ether  
Hexane

**Formula for Preparing Reagent:**

1. Measure out 40 milliliters of hexane and 10 milliliters of ethyl ether.
2. Pour measured solvents into reagent bottle and mix well.
3. Properly label reagent bottle.

**Quality Control Check:**

A quality control check of this reagent will be performed using a known standard of hash and following the application procedure listed below.

**Expiration Date of Chemical Reagent:**

The solvent can be used until depletion provided it is stored in an airtight reagent bottle in a cool place.

**Application of Procedure on Evidence:**

1. A sample of the unknown (approximately 1-2 milligrams) is placed in the well of a porcelain spot plate and several drops of a suitable solvent are added to dissolve sample.

2. A known standard (approximately 1-2 milligrams) is also dissolved in the well of a spot plate with several drops of a suitable solvent. (Known standard is selected after visual observation and/or a series of preliminary tests).

3. With a capillary pipet, several microliters of the unknown and standards solutions are placed side by side approximately 5 millimeters from the bottom of the TLC plate.

4. Add 4:1 solvent to the developing tank to a depth of approximately 2 millimeters and allow several minutes for atmosphere to equilibrate.

5. Allow all the spotting solvent to evaporate from the TLC plate.

6. Place the TLC plate in the developing tank and close the lid.
7. Allow the TLC plate to develop to the top of the plate.

8. Remove the TLC plate from the developing tank and allow the solvent to dry.

9. Visualize with UV light or an appropriate visualizing reagent.

10. Record results.

**Safety Concerns:**

Always wear eye protection, gloves and a laboratory coat when preparing this TLC solvent.

**Literature References:**


**Name of Procedure:**

Thin-Layer Chromatography
10:1 Developing Solvent (ETHANOL)

**Suggested Uses:**

The 10:1 Thin-Layer Chromatography Developing Solvent is used to separate and identify organic compounds. Suggested uses of this TLC solvent include benzodiazepines and similar compounds.

**Apparatus Needed to Perform Procedure Including Preparation of Reagent:**

Thin-Layer Chromatography Plates
   - Silica gel GF - fluorescent indicator
   - Thickness: 250 microns
Developing tank
Micro pipets
UV light (long and short wave)
Fume hood
Gloves
Eye protection
Laboratory coat
Graduated cylinders
Reagent bottle
Funnel
Porcelain spot plate
Spatula
Ethanol
Concentrated ammonium hydroxide.
Potassium chloride

**Formula for Preparing Reagent:**

1. Measure out 10 milliliters of ethanol and 1 milliliter of concentrated ammonium hydroxide.
2. Pour measured solvents into reagent bottle and mix well.
3. Properly label reagent bottle.

**Quality Control Check:**

A quality control check of this reagent will be performed using a known standard of diazepam and following the application procedure listed below.

**Expiration Date of Chemical Reagent:**

The solvent can be used until depletion provided it is stored in an airtight reagent bottle.

**Application of Procedure on Evidence:**

1. A sample of the unknown (approximately 1-2 milligrams) is placed in the well of a porcelain spot plate and several drops of a suitable solvent are added to dissolve the sample.

2. A known standard (approximately 1-2 milligrams) is also dissolved in the well of a spot plate with several drops of a suitable solvent. (Known standard is selected after visual observation and/or a series of preliminary tests).

3. With a capillary pipet, several microliters of the unknown and standards solutions are placed side by side approximately 5 millimeters from the bottom of the TLC plate.

4. Place approximately 1 gram of potassium chloride in the developing tank.

5. Add 10:1 solvent to the developing tank to a depth of approximately 2 millimeters and allow several minutes for atmosphere to equilibrate.

6. Allow all the spotting solvent to evaporate from the TLC plate.

7. Place the TLC plate in the developing tank and close the lid.

8. Allow the TLC plate to develop to the top of the plate.
9. Remove the TLC plate from the developing tank and allow the solvent to dry.

10. Visualize with UV light or an appropriate visualizing reagent.

11. Record results.

**Safety Concerns:**

Always wear eye protection, gloves and a laboratory coat when preparing this TLC solvent.

**Literature References:**


This procedure has been used in the Drug Chemistry Section since 1985.
**Name of Procedure:**

Thin-Layer Chromatography
10:1 Developing Solvent (METHANOL)

**Suggested Uses:**

The 10:1 Thin-Layer Chromatography Developing Solvent is used to separate and identify organic compounds. Suggested uses of this TLC solvent are for benzodiazepines and similar compounds.

**Apparatus Needed to Perform Procedure Including Preparation of Reagent:**

- Thin-Layer Chromatography Plates
  - Silica gel GF - fluorescent indicator
  - Thickness: 250 microns
- Developing tank
- Micro pipets
- UV light (long and short wave)
- Fume hood
- Gloves
- Eye protection
- Laboratory coat
- Graduated cylinders
- Reagent bottle
- Funnel
- Porcelain spot plate
- Spatula
- Methanol
- Concentrated ammonium hydroxide
- Potassium chloride

**Formula for Preparing Reagent:**

1. Measure out 10 milliliters of methanol and 1 milliliter of concentrated ammonium hydroxide.
2. Pour measured solvents into reagent bottle and mix well.

3. Properly label reagent bottle.

**Quality Control Check:**

A quality control check of this reagent will be performed using a known standard of diazepam and following the application procedure listed below.

**Expiration Date of Chemical Reagent:**

The solvent can be used until depletion provided it is stored in an airtight reagent bottle.

**Application of Procedure on Evidence:**

1. A sample of the unknown (approximately 1-2 milligrams) is placed in the well of a porcelain spot plate and several drops of a suitable solvent are added to dissolve the sample.

2. A known standard (approximately 1-2 milligrams) is also dissolved in the well of a spot plate with several drops of a suitable solvent. (Known standard is selected after visual observation and/or a series of preliminary tests).

3. With a capillary pipet, several microliters of the unknown and standards solutions are placed side by side approximately 5 millimeters from the bottom of the TLC plate.

4. Place approximately 1 gram of potassium chloride in the developing tank.

5. Add 10:1 solvent to the developing tank to a depth of approximately 2 millimeters and allow several minutes for atmosphere to equilibrate.

6. Allow all the spotting solvent to evaporate from the TLC plate.

7. Place the TLC plate in the developing tank and close the lid.

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8. Allow the TLC plate to develop to the top of the plate.

9. Remove the TLC plate from the developing tank and allow the solvent to dry.

10. Visualize with UV light or an appropriate visualizing reagent.

11. Record results.

**Safety Concerns:**

Always wear eye protection, gloves and a laboratory coat when preparing this TLC solvent.

**Literature References:**


This procedure has been used in the Drug Chemistry Section since 1985.
Name of Procedure:
Thin-Layer Chromatography
T1 Developing Solvent

Suggested Uses:
The T1 Thin-Layer Chromatography Developing Solvent is used to separate and identify organic compounds. Suggested uses of this TLC solvent include the ergot alkaloids, benzodiazepines, opium alkaloids and other organic compounds.

Apparatus Needed to Perform Procedure Including Preparation of Reagent:
Thin-Layer Chromatography Plates
   Silica gel GF - fluorescent indicator
   Thickness: 250 microns
Developing tank
Micro pipets
UV light (long and short wave)
Fume hood
Gloves
Eye protection
Laboratory coat
Graduated cylinders
Reagent bottle
Funnel
Porcelain spot plate
Spatula
Methanol
Concentrated ammonium hydroxide

Formula for Preparing Reagent:
1. Measure out 100 milliliters of methanol and 1.5 milliliters of concentrated ammonium hydroxide.
2. Pour measured solvents into reagent bottle and mix well.

3. Properly label reagent bottle.

**Quality Control Check:**

A quality control check of this reagent will be performed using a known standard of heroin and following the application procedure listed below.

**Expiration Date of Chemical Reagent:**

The solvent can be used until depletion provided it is stored in an airtight reagent bottle.

**Application of Procedure on Evidence:**

1. A sample of the unknown (approximately 1-2 milligrams) is placed in the well of a porcelain spot plate and several drops of a suitable solvent are added to dissolve the sample.

2. A known standard (approximately 1-2 milligrams) is also dissolved in the well of a spot plate with several drops of a suitable solvent. (Known standard is selected after visual observation and/or a series of preliminary tests).

3. With a capillary pipet, several microliters of the unknown and standards solutions are placed side by side approximately 5 millimeters from the bottom of the TLC plate.

4. Add T1 solvent to the developing tank to a depth of approximately 2 millimeters and allow several minutes for atmosphere to equilibrate.

5. Allow all the spotting solvent to evaporate from the TLC plate.

6. Place the TLC plate in the developing tank and close the lid.

7. Allow the TLC plate to develop to the top of the plate.
8. Remove the TLC plate from the developing tank and allow the solvent to dry.

9. Visualize with UV light or an appropriate visualizing reagent.

**Safety Concerns:**

Always wear eye protection, gloves and a laboratory coat when preparing this TLC solvent.

**Literature References:**


This procedure has been used in the Drug Chemistry Section since 1985.
Name of Procedure:

Thin-Layer Chromatography
18:1 Developing Solvent

Suggested Uses:

The 18:1 Thin-Layer Chromatography Developing Solvent is used to separate and identify organic compounds. Suggested uses of this TLC solvent include opium alkaloids, ergot alkaloids, synthetic opiates, coca alkaloids and other acidic, basic, and neutral organic compounds and drugs.

Apparatus Needed to Perform Procedure Including Preparation of Reagent:

Thin-Layer Chromatography Plates
   Silica gel GF - fluorescent indicator
   Thickness: 250 microns
Developing tank
Micro pipets
UV light (long and short wave)
Fume hood
Gloves
Eye protection
Laboratory coat
Graduated cylinders
Reagent bottle
Funnel
Porcelain spot plate
Spatula
Chloroform
Methanol
Concentrated Ammonium Hydroxide

Formula for Preparing Reagent:

1. Measure out 180 milliliters of ammonia saturated chloroform and 10 milliliters of methanol.
2. Pour measured solvents into reagent bottle and mix well.
3. Properly label reagent bottle.

**Note:** Ammonia saturated chloroform is prepared by shaking chloroform and concentrated ammonium hydroxide in a separatory funnel.

**Quality Control Check:**

A quality control check of this reagent will be performed using a known standard of heroin and following the application procedure listed below.

**Expiration Date of Chemical Reagent:**

The solvent can be used until depletion provided it is stored in an airtight reagent bottle.

**Application of Procedure on Evidence:**

1. A sample of the unknown (approximately 1-2 milligrams) is placed in the well of a porcelain spot plate and several drops of a suitable solvent are added to dissolve the sample.

2. A known standard (approximately 1-2 milligrams) is also dissolved in the well of a spot plate with several drops of a suitable solvent. (Known standard is selected after visual observation and/or a series of preliminary tests).

3. With a capillary pipet, several microliters of the unknown and standards solutions are placed side by side approximately 5 millimeters from the bottom of the TLC plate.

4. Add 18:1 solvent to the developing tank to a depth of approximately 2 millimeters and allow several minutes for atmosphere to equilibrate.

5. Allow all the spotting solvent to evaporate from the TLC plate.

6. Place the TLC plate in the developing tank and close the lid.
7. Allow the TLC plate to develop to the top of the plate.

8. Remove the TLC plate from the developing tank and allow the solvent to dry.

9. Visualize with UV light or an appropriate visualizing reagent.

**Safety Concerns:**

Always wear eye protection, gloves and a laboratory coat when preparing this TLC solvent.

**Literature References:**


This procedure has been used in the Drug Chemistry Section since 1971.
**Name of Procedure:**

Thin-Layer Chromatography  
S₁ Developing Solvent

**Suggested Uses:**

The S₁ Thin-Layer Chromatography Developing Solvent is used to separate and identify organic compounds. Suggested uses of this TLC solvent include opium alkaloids, synthetic opiates, and other organic compounds and drugs.

**Apparatus Needed to Perform Procedure Including Preparation of Reagent:**

- Thin-Layer Chromatography Plates  
  - Silica gel GF - fluorescent indicator  
  - Thickness: 250 microns  
- Developing tank  
- Micro pipets  
- UV light (long and short wave)  
- Fume hood  
- Gloves  
- Eye protection  
- Laboratory coat  
- Graduated cylinders  
- Reagent bottle  
- Funnel  
- Porcelain spot plate  
- Spatula  
- Dioxane  
- Ethyl alcohol  
- Benzene  
- Toluene  
- Ammonium hydroxide

**Formula for Preparing Reagent:**
1. Measure out 5 milliliters of ethanol, 40 milliliters of dioxane, 50 milliliters of toluene, and 5 milliliters of concentrated ammonium hydroxide.

2. Pour measured solvents into reagent bottle and mix well.

3. Properly label reagent bottle.

**Note:** Toluene can be substituted for benzene in the S₁ formulation.

**Quality Control Check:**

A quality control check of this reagent will be performed using a known standard of heroin and following the application procedure listed below.

**Expiration Date of Chemical Reagent:**

The solvent can be used until depletion provided it is stored in an airtight reagent bottle.

**Application of Procedure on Evidence:**

1. A sample of the unknown (approximately 1-2 milligrams) is placed in the well of a porcelain spot plate and several drops of a suitable solvent are added to dissolve the sample.

2. A known standard (approximately 1-2 milligrams) is also dissolved in the well of a spot plate with several drops of a suitable solvent. (Known standard is selected after visual observation and/or a series of preliminary tests).

3. With a capillary pipet, several microliters of the unknown and standards solutions are placed side by side approximately 5 millimeters from the bottom of the TLC plate.

4. Add S₁ solvent to the developing tank to a depth of approximately 2 millimeters and allow several minutes for atmosphere to equilibrate.

5. Allow all the spotting solvent to evaporate from the TLC plate.
6. Place the TLC plate in the developing tank and close the lid.

7. Allow the TLC plate to develop to the top of the plate.

8. Remove the TLC plate from the developing tank and allow the solvent to dry.

9. Visualize with UV light or an appropriate visualizing reagent.

**Safety Concerns:**

Always wear eye protection, gloves and a laboratory coat when preparing this TLC solvent.

**Literature References:**


**Name of Procedure:**

Thin-Layer Chromatography
1:1 Developing Solvent

**Suggested Uses:**

The 1:1 Thin-Layer Chromatography Developing Solvent is used to separate and identify organic compounds. Suggested uses of this TLC solvent are the cannabnoids found in marijuana.

**Apparatus Needed to Perform Procedure Including Preparation of Reagent:**

- Thin-Layer Chromatography Plates
  - Silica gel GF - fluorescent indicator
  - Thickness: 250 microns
- Developing tank
- Micro pipets
- UV light (long and short wave)
- Fume hood
- Gloves
- Eye protection
- Laboratory coat
- Graduated cylinders
- Reagent bottle
- Funnel
- Porcelain spot plate
- Spatula
- Cyclohexane
- Chloroform

**Formula for Preparing Reagent:**

1. Measure out 50 milliliters of cyclohexane and 50 milliliters of chloroform.

2. Pour measured solvents into reagent bottle and mix well.
3. Properly label reagent bottle.

**Quality Control Check:**

A quality control check of this reagent will be performed using a known standard of hash and following the application procedure listed below.

**Expiration Date of Chemical Reagent:**

The solvent can be used until depletion provided it is stored in an airtight reagent bottle.

**Application of Procedure on Evidence:**

1. A sample of the unknown (approximately 1-2 milligrams) is placed in the well of a porcelain spot plate and several drops of a suitable solvent are added to dissolve the sample.

2. A known standard (approximately 1-2 milligrams) is also dissolved in the well of a spot plate with several drops of a suitable solvent. (Known standard is selected after visual observation and/or a series of preliminary tests).

3. With a capillary pipet, several microliters of the unknown and standards solutions are placed side by side approximately 5 millimeters from the bottom of the TLC plate.

4. Add 1:1 solvent to the developing tank to a depth of approximately 2 millimeters and allow several minutes for atmosphere to equilibrate.

5. Allow all the spotting solvent to evaporate from the TLC plate.

6. Place the TLC plate in the developing tank and close the lid.

7. Allow the TLC plate to develop to the top of the plate.
8. Remove the TLC plate from the developing tank and allow the solvent to dry.

9. Visualize with UV light or an appropriate visualizing reagent.

**Safety Concerns:**

Always wear eye protection, gloves and a laboratory coat when preparing this TLC solvent.

**Literature References:**


This procedure has been used in the Drug Chemistry Section since 1971.
Name of Procedure:

Thin-Layer Chromatography
T2 Developing Solvent

Suggested Uses:

The T2 Thin-Layer Chromatography Developing Solvent is used to separate and identify organic compounds. Suggested uses of this TLC solvent include opium alkaloids, opiate alkaloids and ergot alkaloids.

Apparatus Needed to Perform Procedure Including Preparation of Reagent:

Thin-Layer Chromatography Plates
  Silica gel GF - fluorescent indicator
  Thickness: 250 microns
Developing tank
Micro pipets
UV light (long and short wave)
Fume hood
Gloves
Eye protection
Laboratory coat
Graduated cylinders
Reagent bottle
Funnel
Porcelain spot plate
Spatula
Cyclohexane
Acetone
Diethylether
Diethylamine

Formula for Preparing Reagent:

1. Measure out 35 milliliters of cyclohexane, 30 milliliters of acetone, 30 milliliters of
diethylether, and 5 milliliters of diethylamine.

2. Pour measured solvents into reagent bottle and mix well.

3. Properly label reagent bottle.

**Quality Control Check:**

A quality control check of this reagent will be performed using a known standard of LSD and following the application procedure listed below.

**Expiration Date of Chemical Reagent:**

The solvent can be used until depletion provided it is stored in an airtight reagent bottle in a cool place.

**Application of Procedure on Evidence:**

1. A sample of the unknown (approximately 1-2 milligrams) is placed in the well of a porcelain spot plate and several drops of a suitable solvent are added to dissolve the sample.

2. A known standard (approximately 1-2 milligrams) is also dissolved in the well of a spot plate with several drops of a suitable solvent. (Known standard is selected after visual observation and/or a series of preliminary tests).

3. With a capillary pipet, several microliters of the unknown and standards solutions are placed side by side approximately 5 millimeters from the bottom of the TLC plate.

4. Add T2 solvent to the developing tank to a depth of approximately 2 millimeters and allow several minutes for atmosphere to equilibrate.

5. Allow all the spotting solvent to evaporate from the TLC plate.
6. Place the TLC plate in the developing tank and close the lid.

7. Allow the TLC plate to develop to the top of the plate.

8. Remove the TLC plate from the developing tank and allow the solvent to dry.

9. Visualize with UV light or an appropriate visualizing reagent.

10. Record results.

**Safety Concerns:**

Always wear eye protection, gloves and a laboratory coat when preparing this TLC solvent.

**Literature References:**


This procedure has been used in the Drug Chemistry Section since 1985.
**Name of Procedure:**

Thin-Layer Chromatography  
Iodoplatinate Visualizing Reagent

**Suggested Uses:**

A visualizing reagent or detection reagent must be used in Thin-Layer Chromatography if the compound or compounds are not distinguishable by their own color. Opium alkaloids, coca alkaloids and most nitrogen containing compounds can be visualized using the iodoplatinate spray reagent. Refer to page 135, Clarke’s Isolation and Identification of Drugs, (see Literature References) for color formations of various drugs.

**Apparatus Needed to Perform Procedure Including Preparation of Reagent:**

- Fume hood  
- Graduated cylinder  
- Eye protection  
- Balance  
- Laboratory coat  
- Gloves  
- Spray bottle  
- Air compressor  
- Funnel  
- Spatula  
- Bottles  
- Tygon or rubber tubing  
- Platinic chloride (chloroplatinic acid)  
- Potassium iodide  
- Water

**Formula for Preparing Reagent:**

1. Dissolve 1 gram of platinic chloride (chloroplatinic acid) to 10 milliliters of water.
2. Add this solution to 10 grams of potassium iodide dissolved in 250 milliliters of water.

3. Dilute the solution from Step 1 to 500 milliliters with water.

4. Place desired amount in spray bottle.

5. The remaining iodoplatinate solution can be stored in a reagent bottle in a cool place.

6. Properly label spray reagent.

**Quality Control Check:**

A quality control check of this reagent will be performed using a known standard of heroin and following the application procedure listed below.

**Expiration Date of Chemical Reagent:**

The iodoplatinate reagent can be used until depletion.

**Application of Procedure on Evidence:**

1. Place well-dried TLC plate in hood.

2. Activate hood.

3. Using the air compressor and spray bottle, apply a fine mist of the visualizing reagent to the TLC plate.

4. Apply the visualizing reagent until the spot corresponding to the known standard appears.

5. Compare the known standard and the compound in question for their size, shape, color and position on the TLC plate.
6. Record the results of your observation.

**Safety Concerns:**
Always wear eye protection, gloves, and a laboratory coat when preparing this reagent for use.

Eye protection and a laboratory coat should be worn when visualizing the TLC plate.

**Literature References:**


This procedure has been used in the Drug Chemistry Section since 1971.
Name of Procedure:

Thin-Layer Chromatography
p-DMAB Visualizing Reagent

Suggested Uses:

A visualizing reagent or detection reagent must be used in Thin-Layer Chromatography if the compound or compounds are not distinguishable by their own color. Suggested uses for the p-DMAB spray reagent are indole compounds, ergot alkaloids, and other organic compounds. Refer to page 132, Clarke's Isolation and Identification of Drugs, and pages 631-649, “Spot Tests: A Color Reference for Forensic Chemists”, (see Literature References) for color formations of various drugs.

Apparatus Needed to Perform Procedure Including Preparation of Reagent:

Fume hood
Graduated cylinder
Eye protection
Balance
Laboratory coat
Gloves
Spray bottle
Air compressor
Funnel
Spatula
Bottles
Tygon or rubber tubing
p-DMAB (para-dimethylaminobenzaldehyde)
Ethanol
Methanol
Concentrated hydrochloric acid

Formula for Preparing Reagent:

1. Weigh out 1.0 gram of p-DMAB (para-dimethylaminobenzaldehyde).
2. Add 5 milliliters of concentrated hydrochloric acid to 95 milliliters of methanol or ethanol.

3. Add the 1.0 gram of p-DMAB to the alcohol-hydrochloric acid mixture.

4. Place this solution in the spray bottle.

5. Properly label spray reagent.

Note: If you make up a stock solution of this reagent, store it in the refrigerator and do not add the hydrochloric acid until you place it in the spray bottle.

Quality Control Check:

A quality control check of this reagent will be performed using a known standard of LSD and following the application procedure listed below.

Expiration Date of Chemical Reagent:

The p-DMAB spray reagent is stable and can be used until depletion.

Application of Procedure on Evidence:

1. Place well-dried TLC plate in hood.

2. Activate hood.

3. Using the air compressor and spray bottle, apply a fine mist of the visualizing reagent to the TLC plate.

4. Apply the visualizing reagent until the spot corresponding to the known standard appears.

5. Compare the known standard and the compound in question for their size, shape, color and position on the TLC plate.
6. Record the results of your observation.

**Safety Concerns:**

Always wear eye protection, gloves, and a laboratory coat when preparing this reagent for use.

Eye protection and laboratory coat should be worn when visualizing the TLC plate.

**Literature References:**


This procedure has been used in the Drug Chemistry Section since 1971.
**Name of Procedure:**

Thin-Layer Chromatography  
Fast Blue B Visualizing Reagent

**Suggested Uses:**

A visualizing reagent or detection reagent must be used in Thin-Layer Chromatography if the compound or compounds are not distinguishable by their own color. This spray reagent is primarily used to visualize cannabinoids found in marijuana. Cannabidiol gives an orange color, cannabinol gives a violet color, and delta-9-tetrahydrocannabinol gives a red color when reacted with this reagent.

**Apparatus Needed to Perform Procedure Including Preparation of Reagent:**

- Fume hood  
- Graduated cylinder  
- Eye protection  
- Balance  
- Laboratory coat  
- Gloves  
- Spray bottle  
- Air compressor  
- Funnel  
- Spatula  
- Bottles  
- Tygon or rubber tubing  
- Fast Blue B salt  
- Water

**Formula for Preparing Reagent:**

1. Weigh out 1 gram of Fast Blue B salt.
2. Dissolve the Fast Blue B salt in approximately 100 milliliters of water.
3. Place in spray reagent bottle.

4. Properly label spray reagent.

**Quality Control Check:**

A quality control check of this reagent will be performed using a known standard of hash and following the application procedure listed below.

**Expiration Date of Chemical Reagent:**

The Fast Blue B spray reagent will decompose after two weeks.

**Application of Procedure on Evidence:**

1. Place well-dried TLC plate in hood.

2. Activate hood.

3. Using the air compressor and spray bottle, apply a fine mist of the visualizing reagent to the TLC plate.

4. Apply the visualizing reagent until the spot corresponding to the known standard appears.

5. Compare the known standard and the compound in question for their size, shape, color and position on the TLC plate.

6. Record the results of your observation.

**Safety Concerns:**

Always wear eye protection, gloves, and a laboratory coat when preparing this reagent for use.

Eye protection and laboratory coat should be worn when visualizing the TLC plate.
Fast Blue B is a suspected carcinogen.

**Literature References:**


This procedure has been used in the Drug Chemistry Section since 1971.
Name of Procedure:

Thin-Layer Chromatography
Sulfuric Acid Visualizing Reagent

Suggested Uses:

A visualizing reagent or detection reagent must be used in Thin-Layer Chromatography if the compound or compounds are not distinguishable by their own color. A range of colors is obtained with compounds of various types when reacted with sulfuric acid. Refer to pp. 145-146, Clarke's Isolation and Identification of Drugs, and pp. 631-649, “Spot Tests: A Color Chart Reference for Forensic Chemists”, (see Literature References) for color formations with various drugs.

Apparatus Needed to Perform Procedure Including Preparation of Reagent:

Fume hood
Graduated cylinder
Eye protection
Balance
Laboratory coat
Gloves
Spray bottle
Air compressor
Funnel
Spatula
Bottles
Tygon or rubber tubing
Concentrated sulfuric acid
Ethanol

Formula for Preparing Reagent:

1. Gradually add 10 milliliters of concentrated sulfuric acid to 90 milliliters of ethanol.

2. Place in spray reagent bottle.
3. Properly label spray reagent.

**Quality Control Check:**

A quality control check of this reagent will be performed using a known standard of heroin and following the application procedure listed below.

**Expiration Date of Chemical Reagent:**

This spray reagent can be used to depletion.

**Application of Procedure on Evidence:**

1. Place well-dried TLC plate in hood.
2. Activate hood.
3. Using the air compressor and spray bottle, apply a fine mist of the visualizing reagent to the TLC plate.
4. Place the TLC plate in a hot oven and allow time for the color formation to take place.
5. Compare the known standard and the compound in question for their size, shape, color and position on the TLC plate.
6. Record the results of your observation.

**Safety Concerns:**

Always wear eye protection, gloves, and a laboratory coat when preparing this reagent for use.

Eye protection and laboratory coat should be worn when visualizing the TLC plate.
Literature References:


This procedure has been used in the Drug Chemistry Section since 1971.
Name of Procedure:

Thin-Layer Chromatography
Iodine Visualizing Reagent

Suggested Uses:

A visualizing reagent or detection reagent must be used in Thin-Layer Chromatography if the compound or compounds are not distinguishable by their own color. Benzodiazepines and other unsaturated compounds can be visualized in an iodine chamber. Organic compounds form a brown complex when reacted with iodine vapor. This visualizing method is usually nondestructive and warming the plate will sublime the iodine, leaving the organic compounds unchanged.

Apparatus Needed to Perform Procedure Including Preparation of Reagent:

Fume hood
Graduated cylinder
Eye protection
Laboratory coat
Gloves
Funnel
Spatula
Iodine chamber
Iodine

Formula for Preparing Reagent:

1. Iodine is the only chemical needed.

2. To prepare the iodine chamber, place several iodine crystals in the airtight chamber.

Quality Control Check:

A quality control check of this reagent will be performed using a known standard of heroin and following the application procedure listed below.
Expiration Date of Chemical Reagent:

The iodine chamber will be active until all the iodine crystals have vaporized.

Application of Procedure on Evidence:

1. Place well-dried TLC plate in the iodine chamber.

2. Remove the TLC plate from the iodine chamber after the known standard has reacted with the iodine and a brown spot appears.

3. Compare the known standard and the compound in question for their size, shape, color and position on the TLC plate.

4. Record the results of your observation.

Safety Concerns:

Always wear eye protection, gloves, and a laboratory coat when preparing this reagent for use.

Eye protection and laboratory coat should be worn when visualizing the TLC plate.

Literature References:


This procedure has been used in the Drug Chemistry Section since 1971.