



# Emerging Trends in Synthetic Drugs: Mid-Atlantic Region



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# Objectives

- State Legislation
  - Compound Trends
  - Analytical Approaches
  - Reporting Results
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# Mid-Atlantic Region

## State Legislation

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# Legislation

- Virginia
  - Amendments to VA Code in March 2011, July 2012 and March 2013
  - Synthetic Cannabinoids - § 18.2-248.1:1
    - 26 Specifically Listed Compounds
    - Eleven Structural Classes
  - Schedule I - § 4.1-3446
    - 41 Specifically Listed Compounds added through legislation since July 2012

# Legislation

- Synthetic Cannabinoid Definition:
  - Virginia:
    - Any substance that contains one or more cannabimimetic agents or that contains their salts, isomers, and salts of isomers
    - ‘Cannabimimetic agent’ is any substance within any of eleven defined structural classes or is specifically listed under § 18.2-248.1:1(A)(2)

# Structural Classes

## 2012

- a. Cyclohexylphenols
- b. Naphthoylindoles  
Naphthylmethylindoles
- c. Naphthoylpyrroles
- d. Naphthylmethylindenes
- e. Phenylacetylindoles  
3-Benzoylindoles

## 2013

- f. 3-cyclopropoylindoles
- g. 3-adamantoylindoles
- h. N-(adamantyl)-indole-3-carboxamides
- i. N-(adamantyl)-indazole-3-carboxamides

# Legislation

- Virginia Code § 18.2-248.1:1(F)
  - “Designer Drug” (analog) clause
    - Privately compounded with intent to circumvent criminal penalties
    - Chemical changes
  - “emulate or simulate effects”

# Legislation

- Maryland

- 2008 Provision in Maryland law allowed for the use of Federal Controlled Dangerous Substances (CDS) Regulations
- July 2012: Adoption of Synthetic and Drug Abuse Prevention Act of 2012
- House Bill 1 – Effective October 1, 2013
  - Cannabimimetic Agents under Schedule I



# Legislation

- Pennsylvania
  - Senate Bill No. 1006 (Enacted 2011)
    - Resembles legislation passed on Federal level
    - Synthetic cannabinoids and psychedelic phenethylamines ('2C-' compounds) added to Schedule I



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# Mid-Atlantic Region

## Compound Trends

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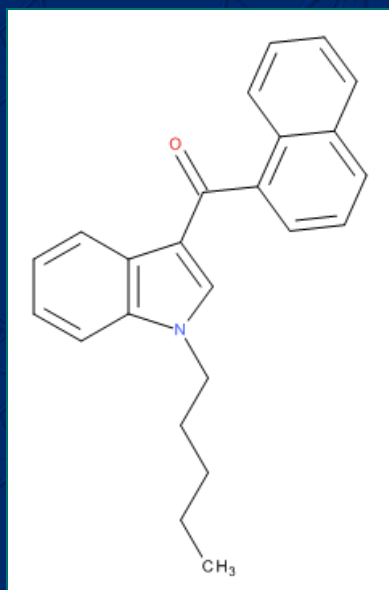


# Compound Trends

- Direct correlation to enacted legislation
  - Many distributors are acutely aware of legislation and adapt quickly
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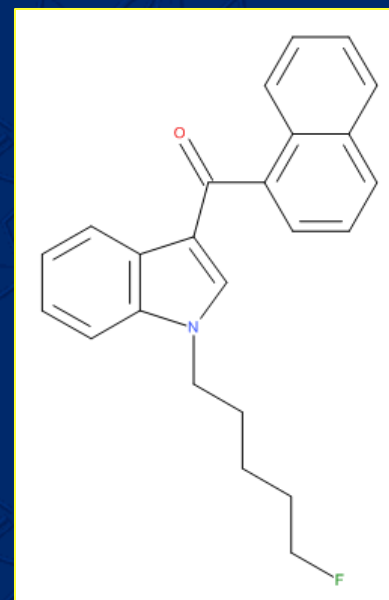
# Compound Trends

## Virginia Synthetic Cannabinoids Trends



JWH-018  
2010-2011

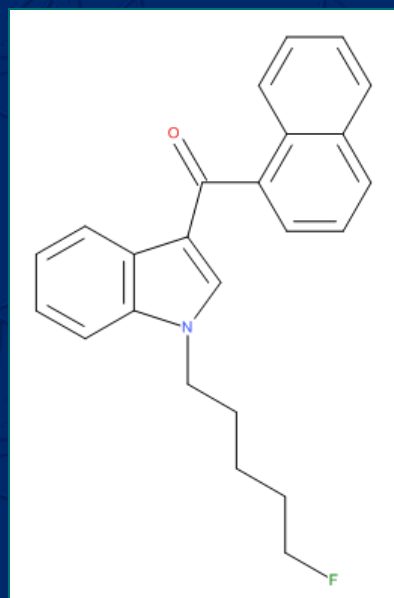
SB745/HB1434  
Enacted-Effective  
23Mar2011



AM-2201  
2011-2012

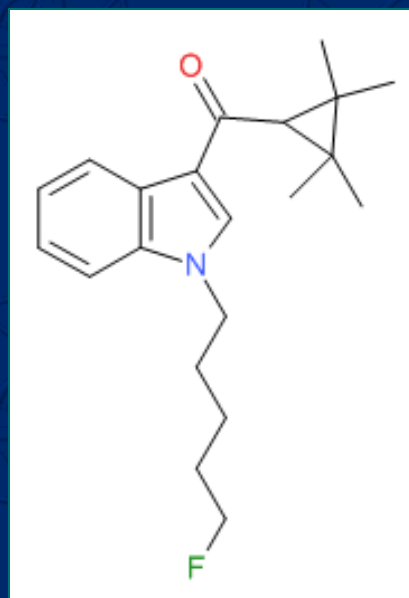
# Compound Trends

## Virginia Synthetic Cannabinoid Trends



AM-2201  
2011-2012

HB508 /SB273  
Enacted – Effective  
01Jul2012



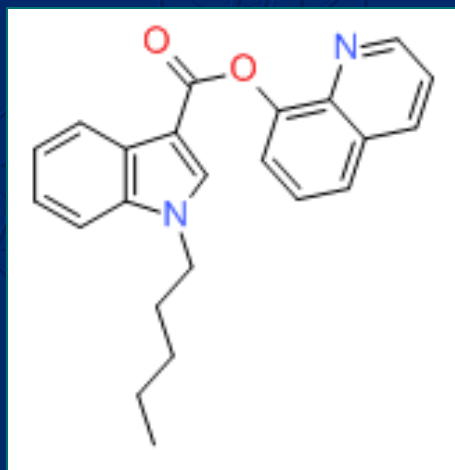
XLR-11  
2012-2013

HB1941  
Enacted-  
Effective  
13Mar2013



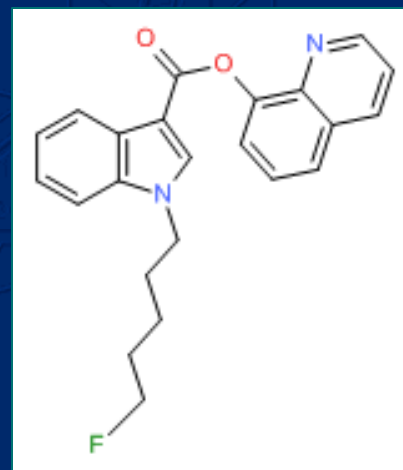
# Compound Trends

- The wave of the (near) future:



**PB-22**

(8-quinolinyl)(1-pentylindol-3-yl)carboxylate  
MW = 358.4

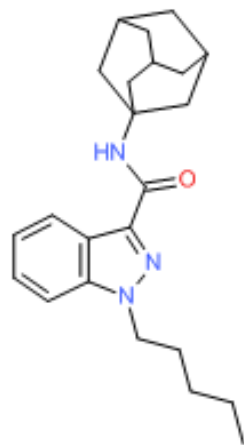


**5F-PB-22**

(8-quinolinyl)(1-(5-fluoropentyl)indol-3-yl)carboxylate  
MW = 376.4

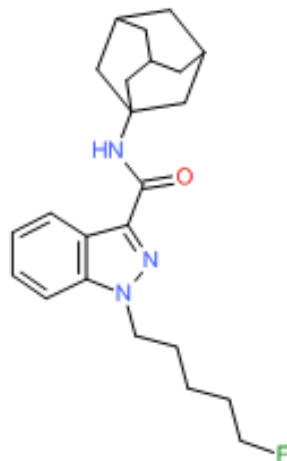
# Compound Trends

- AKB48, 5F-AKB48, STS-135



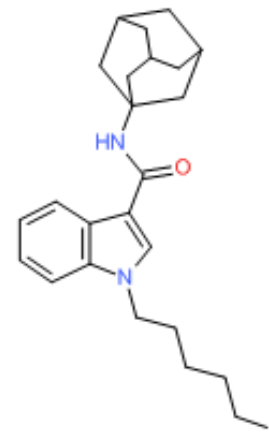
AKB48

N-adamantyl-1-pentylindazole-3-carboxamide  
MW=365



5F-AKB48

N-adamantyl-1-(5-fluoropentyl)indazole-3-carboxamide  
MW=383



STS-135

N-adamantyl-1-(5-fluoropentyl)indazole-3-carboxamide  
MW=382

# Trends

Brand	Compound
AK-47	<u>XLR-11</u>
AMPED	<u>A-PVP, LIDOCAINE, BENZOCAINE, CAFFEINE</u>
BAYOU BLASTER	<u>XLR-11</u>
BLAZE-IT	<u>STS-135</u>
CALIFORNIA DREAMS	<u>UR-144 and XLR-11</u>
CARE-FREE POTPOURRI	<u>5-MEO-DALT</u>
CLEAR	<u>A-PVP, CAFFEINE</u>
D.O.A.	<u>UR-144 and MXE</u>
DEMON FREE	<u>XLR-11</u>
GET SOME SUPER KUSH	<u>AM-2201, AM-2233, JWH-210, AND AM-1248</u>
GREEN COBRA	<u>AM-2201 and JWH-210</u>
HAMPSTER PURP	<u>XLR-11</u>
INCREDIBLE HULK PURPLE CRONIC	<u>UR-144 and XLR-11</u>
JUDGEMENT DAY	<u>UR-144 and XLR-11</u>
KUSH STRAWBERRY	<u>UR-144</u>
LEGAL RX	<u>MITRAGYNINE(KRATOM)</u>
MAKES SCENTS	<u>UR-144</u>
MR. HAPPY	<u>UR-144 and XLR-11</u>
MR. NICE GUY - OMG	<u>UR-144 and XLR-11</u>
OBLIVION	<u>IWH-018</u>
ORGAZMO	<u>XLR-11</u>
PURP	<u>UR-144 and XLR-11</u>
SATIVAH	<u>NO CONTROLLED SUBSTANCES</u>
SCOOBY SNAX	<u>UR-144 and XLR-11</u>
SKUNK 101	<u>UR-144 and XLR-11</u>
SONIC ZERO - BLUEBERRY	<u>XLR-11</u>
STRAWBERRY BASH	<u>NO CONTROLLED SUBSTANCES</u>
SUPER KUSH	<u>XLR-11</u>
YELLA	<u>AM-2201</u>



# Compound Trends

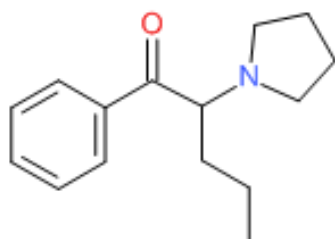
- Mushrooms and Monkeys and Turtles, Oh My!



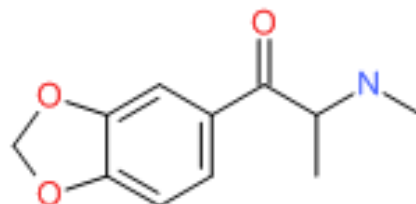
# Compound Trends



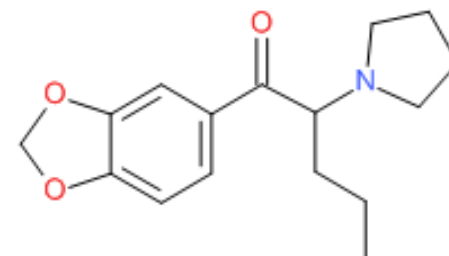
# Compound Trends



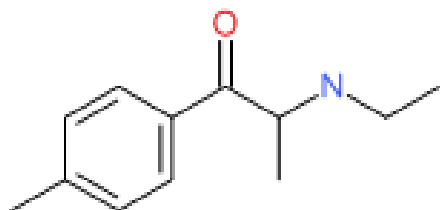
$\alpha$ -pyrrolidinovalerophenone  
( $\alpha$ -PVP)  
 $\alpha$ -pyrrolidinopentiophenone  
MW=231



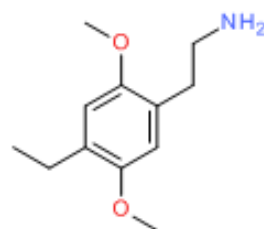
3,4-methylenedioxyamfetamine  
(Mephedrone)  
MW=207



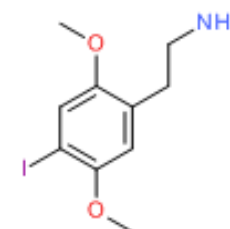
MDPV  
3,4-methylenedioxypropylamfetamine  
MW=275



4-Methylamfetamine  
(4-MEC)  
MW=191



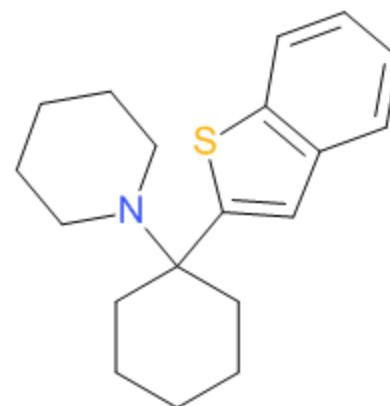
4-ethyl-2,5-dimethoxyphenethylamine  
2C-E  
MW=209



4-iodo-2,5-dimethoxyphenethylamine  
2C-I  
MW=307

# Compound Trends

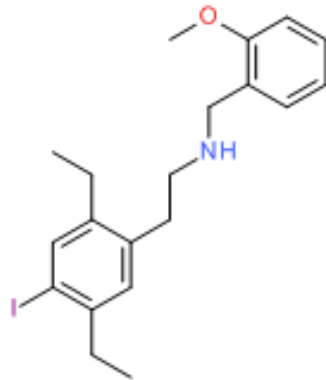
- Illicit Tablets and Capsules
  - Caffeine and more Caffeine!
  - Recent Trend
    - BenThiophenylCyclohexylPiperidine
      - AKA: Benocyclidine, BTCP
    - 3,4-MDMA Returns



benzothiophenylcyclohexylpiperidine  
Benocyclidine  
BTCP  
MW=299

# Compound Trends

- Blotter paper?
  - 25I-NBOMe



25I-NBOMe

4-Iodo-2,5-dimethoxy-N-[(2-methoxyphenyl)methyl]-benzeneethanamine  
MW=427

- 25C-NBOMe
  - Five confirmed cases in Virginia

# Compound Trends

- Lysergic Acid Diethylamide



- Food Items
  - Marijuana preparations
  - 4-Acetoxy-dimethyltryptamine
- Undosed plant material



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# Mid-Atlantic Region

## Analytical Approaches

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# Analytical Approaches

- Traditional Approach

- Color Tests

- Marquis

- 25I-NBOMe – Avocado green
      - BTCP – Indigo blue



- GC/MS

- $R_t$  Comparison

- Traditional: HP-5, HP-1 (15m x 0.25mm i.d.)
      - HP-35 (15m x 0.25mm i.d.)




# Analytical Approaches

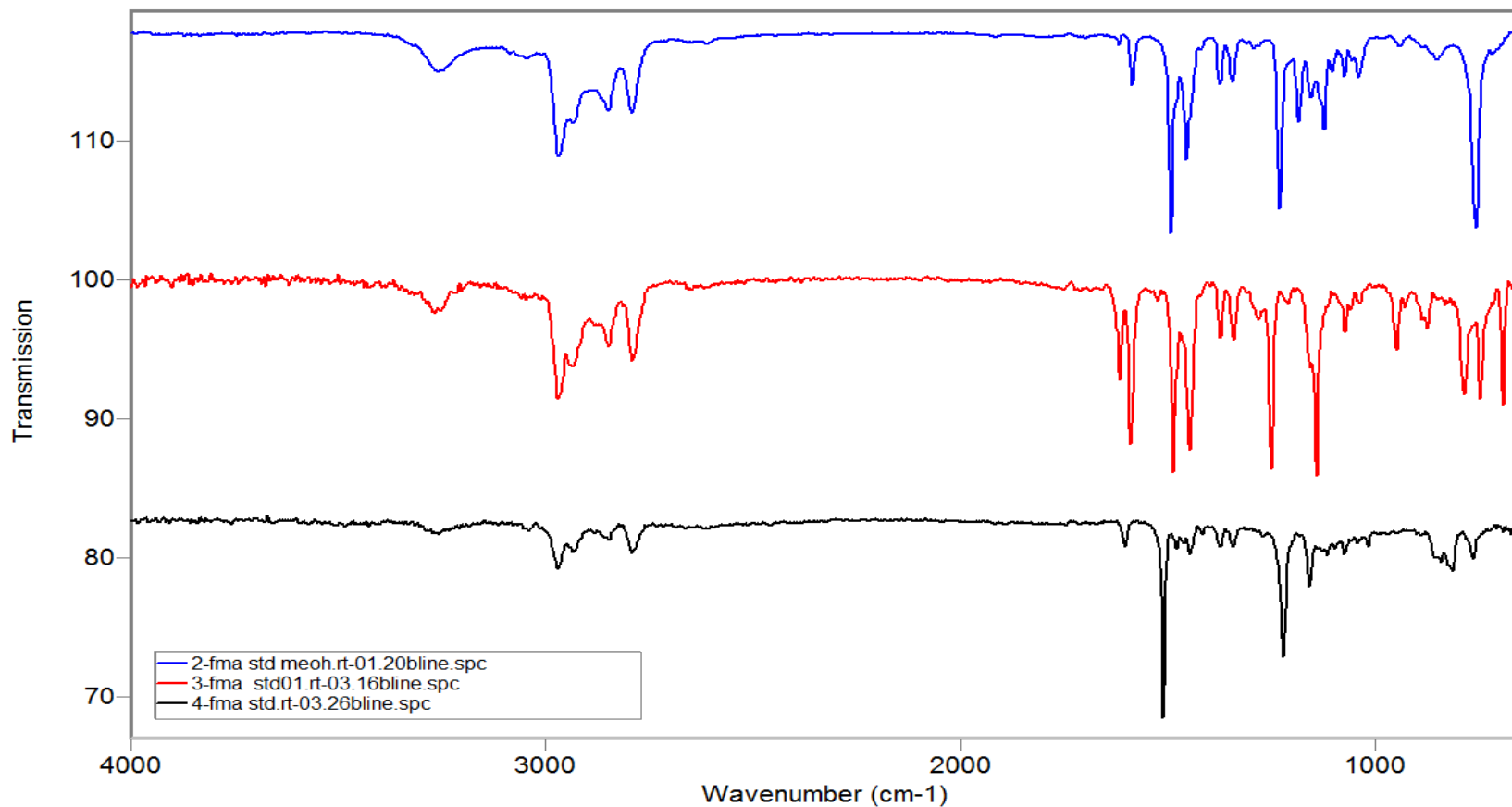
Compound	HP-1 R., (min)	HP-5 R. (min)	HP-35 R. (min)
Cannabidiol	1.71	1.76	2.22
Δ 9-THC	1.89	1.95	2.47
Cannibinol	2.02	2.09	2.65
CP 47,497	2.06	2.14	2.67
CP 47,497 C8 homolog	2.26	2.34	2.89
CP 55, 940	2.87	3.03	4.12
JWH-203	2.73	2.91	4.24
HU-211	2.93	3.12	4.34
HU-210	2.94	3.14	4.35
JWH-250	2.75	2.95	4.39
RCS-4	2.87	3.09	4.72
JWH-201	2.95	3.2	4.91
JWH-015	3.04	3.33	5.55
JWH-073	3.11	3.42	5.79
JWH-018	3.37	3.73	6.41
JWH-019	3.68	4.12	7.21
JWH-122	3.83	4.33	8.04
AM-2201	3.71	4.22	8.18
JWH-210	4.07	4.64	8.66
AM-2233	4.04	4.60	9.11
JWH-081	4.41	5.10	10.53
AM-1220	4.93	5.76	12.54
JWH-200	5.09	6.09	14.57
Salvinorin A	3.42	3.80	5.61, 6.54
XLR-11	2.06	2.18	2.72
XLR-11 2FP isomer	1.86	1.94	2.39
XLR-11 3FP isomer	1.9	1.98	2.46
XLR-11 4FP isomer	1.95	2.04	2.55



# Analytical Approaches

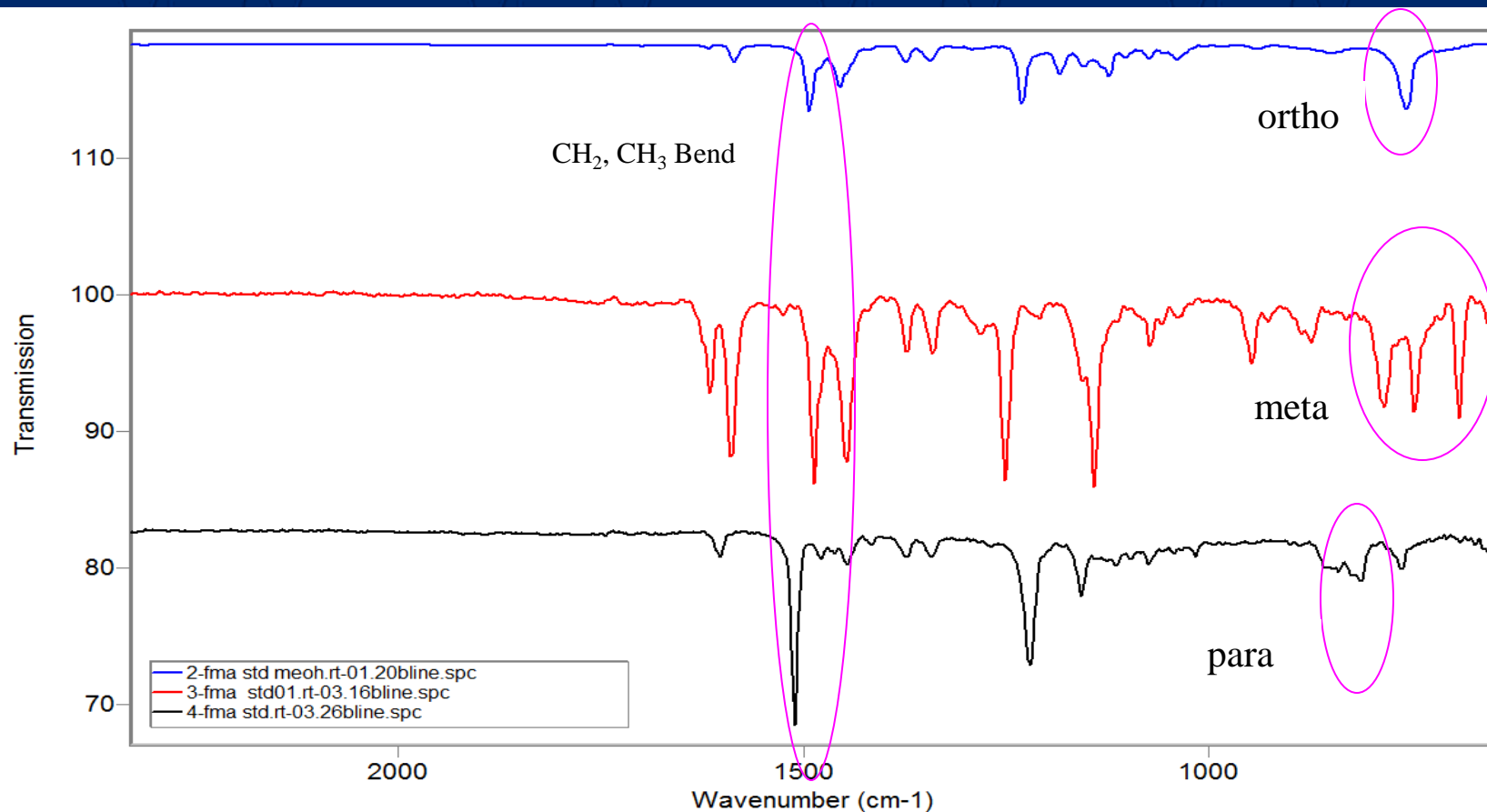
- 'Novel' Approach
    - DART-TOF
      - Efficient screening
      - Exact Mass
    - DiscovIR
      - GC/FTIR (solid state)
- 

# Analytical Approaches



Fluoromethamphetamine positional isomers

# Analytical Approaches



Fluoromethamphetamine positional isomers



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# Mid-Atlantic Region

## Reporting

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# Reporting

- Virginia
  - Synthetic Cannabinoids
    - When a Listed Synthetic Cannabinoid is present: “0.254 gram of powder, found to contain 1-pentyl-3-(1-naphthoyl)indole (JWH-018) (a synthetic cannabinoid listed in § 18.2-248.1:1).”
    - When a compound within a defined structural class is present (but not specifically listed): “0.254 gram of plant material, found to contain 1-propyl-2-methyl-3-(1-naphthoyl)indole (JWH-015). This compound is a synthetic cannabinoid as defined in § 18.2-248.1:1(A)(1)(b) and is within the structural class 3-(1-naphthoyl)indole.”

# Reporting

- Virginia
  - Synthetic Cannabinoids (cont)
    - When a Non-Listed/Non-Structural Class Synthetic Cannabinoid may be present, but is not identified:
      - “No controlled substances or synthetic cannabinoids defined in § 18.2-248.1:1(A) were **identified.**”

# Reporting

- Maryland
  - [Name of compound]
  - [Schedule]
    - “Not a Controlled Dangerous Substance”
    - “No Controlled Dangerous Substance Detected”
- Pennsylvania
  - Analog language:
    - Identified and scheduled substance to which it is structurally similar is indicated in results





# Acknowledgements

- Maryland
  - Eileen M. Briley, Maryland State Police
  - Jessica Taylor, Maryland State Police
- Pennsylvania
  - Kristen Clemens, Cumberland County Office of the District Attorney

# Questions

