

State and Local Emerging Trends in Synthetic Drugs: A California Perspective

May 1, 2013



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²Los Angeles Sheriff's Department, Controlled Substances Laboratory

- California State Legislation
- Caseload
 - Types of samples submitted
- Analytical Considerations
- Reporting Issues

State Legislation

SB420

- Senator Hernandez introduced Feb 16, 2011

- **SB 420** (Hernandez [D]) Synthetic cannabinoid compounds. (I-02/16/2011)
- **Status:** 03/31/2011-Set, first hearing. Further hearing to be set.
- **Current Location:** 02/24/2011-S PUB. S.
- **Calendar Events:** 04/12/11 9:30 a.m. - Room 3191 SEN PUBLIC SAFETY
- **Summary:** Existing law, the California Uniform Controlled Substances Act, classifies controlled substances into 5 designated schedules, with the most restrictive limitations generally placed on controlled substances classified in Schedule I, and the least restrictive limitations generally placed on controlled substances classified in Schedule V. Under existing law, the sale or distribution of specified intoxicating substances is a crime, punishable by imprisonment or a fine or both. Existing law makes the possession of not more than 28.5 grams of marijuana an infraction, and the possession of more than 28.5 of marijuana a misdemeanor, as specified. Existing law makes possession of marijuana for sale a felony. This bill would make the possession of not more than 28.5 grams of any synthetic cannabinoid compound an infraction and the possession of more than 28.5 of any synthetic cannabinoid compound a misdemeanor, as specified. The bill would make possession of any synthetic cannabinoid compound for sale a felony. Because this bill would create a new crime it would impose a state-mandated local program. This bill contains other related provisions and other existing laws.
- **Assigned ALLEN** Position Oppose Unless Amended.

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California Narcotics Officers Association (CNOA)

- To educate the membership and public of the dangers of narcotic and drug abuse.
- To benefit the public interest in the area of narcotic and drug enforcement.
- To promote and foster mutual cooperation between narcotic enforcement officers, their agencies, private industries and the public sector.
- To provide an avenue for the exchange of ideas and the new techniques used by criminals and investigators.
- To conduct training seminars for narcotic officers, law enforcement officers, private industries, schools and the general public.
- To take notice of new trends in narcotic and drug abuse.
- To provide narcotic and drug abuse information suitable for distribution to the adult and juvenile public.
- To study pending and propose legislation in the area of narcotics and drug abuse enforcement.
- To keep their members and the public informed of current statutes, statute changes and judicial decisions.
- To recommend, if necessary, correct legislation that the association considers to be in the best interest of the public in the area of narcotic and drug abuse.

SB420

- Senator Hernandez introduced Feb 16, 2011
- Amended April 4, 2011, still had 28.5 g language
 - Added named 5 synthetic cannabinoids
 - JWH-018, JWH-073, JWH-200, CP-47,497 and cannabicyclohexanol
- Amended June 28, 2011 to its current form

Legislation passed October 2, 2011

- 11357.5. (a) Every person who sells, dispenses, distributes, furnishes, administers, or gives, or offers to sell, dispense, distribute, furnish, administer, or give, or possesses for sale any synthetic cannabinoid compound, or any synthetic cannabinoid derivative, to any person, is guilty of a misdemeanor punishable by imprisonment in a county jail not exceeding six months, or by a fine not exceeding one thousand dollars (\$1,000), or by both that fine and imprisonment. (b) As used in this section, the term "synthetic cannabinoid compound" refers to any of the following substances:
 - (1) 1-pentyl-3-(1-naphthoyl)indole (JWH-018).
 - (2) 1-butyl-3-(1-naphthoyl)indole (JWH-073).
 - (3) 1-[2-(4-morpholinyl)ethyl]-3-(1-naphthoyl)indole (JWH-200).
 - (4) 5-(1,1-dimethylheptyl)-2-[(1R,3S)-3-hydroxycyclohexyl]-phenol (CP-47,497).
 - (5) 5-(1,1-dimethyloctyl)-2-[(1R,3S)-3-hydroxycyclohexyl]-phenol (cannabicyclohexanol; CP-47,497 C8 homologue).

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 - JWH-018, JWH-073, JWH-200, CP-47,497 and cannabicyclohexanol
- Amended June 28, 2011 to its current form
 - This bill PASSED the Senate
 - 37 voted YES // 0 voted NO 3 voted present/not voting
- Chaptered October 2, 2011 as part of H&S Code 11357.5

How to charge MDMA in California...



MDMA



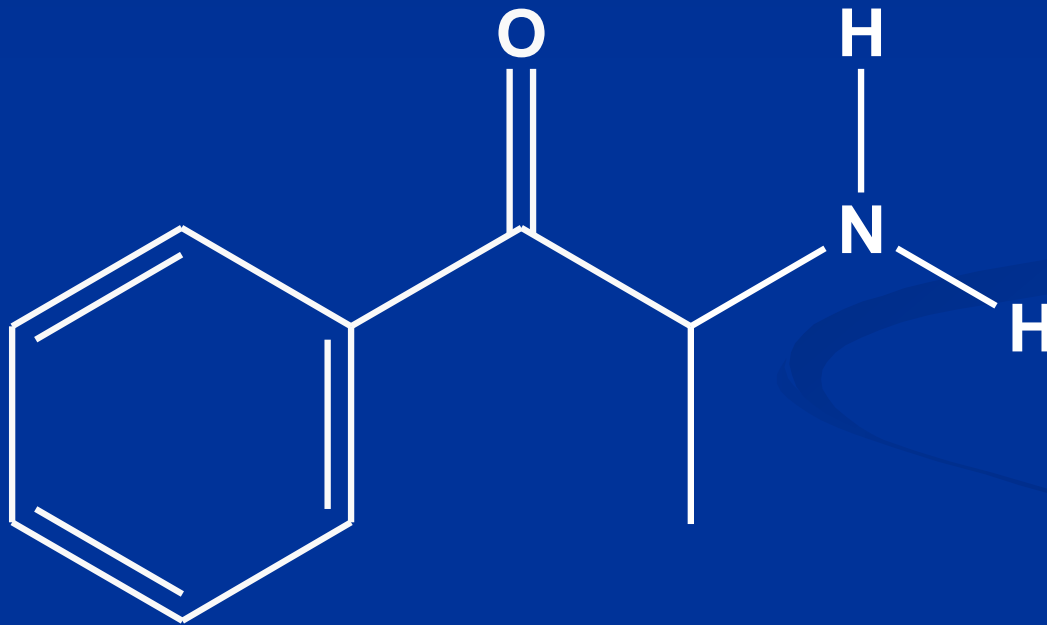
As an analog of MDA

Analog Law: H&S 11401

- (a) A **controlled substance analog** shall, for the purposes of Chapter 6 (commencing with Section 11350), **be treated the same as the controlled substance** classified in Section 11054 or 11055 **of which it is an analog.**
- (b) Except as provided in subdivision (c), the term "controlled substance analog" means either of the following:
 - (1) A substance the **chemical structure of which is substantially similar** to the chemical structure of a controlled substance classified in Section 11054 or 11055.
 - (2) A substance which has, is represented as having, or is intended to have a stimulant, depressant, or hallucinogenic **effect on the central nervous system that is substantially similar** to, or greater than, the stimulant, depressant, or hallucinogenic effect on the central nervous system of a controlled substance classified in Section 11054 or 11055.

Cathinone (Norephedrone)

Passed Federally: Schedule I in 1993



California: Schedule II (H&S 11055),
July 1, 2010



Cathinone Analogs

H & S 11375.5 (a), Oct 9, 2011

Every person who **sells**, dispenses, distributes, furnishes, administers, or gives, or offers to sell, dispense, distribute, furnish, administer, or give, any synthetic stimulant compound specified in subdivision (b), or any synthetic stimulant derivative, to any person, or who possesses that compound or derivative for sale, is guilty of a **misdemeanor** punishable by imprisonment in a county jail not exceeding six months, or by a fine not exceeding one thousand dollars (\$1,000), or by both that fine and imprisonment.

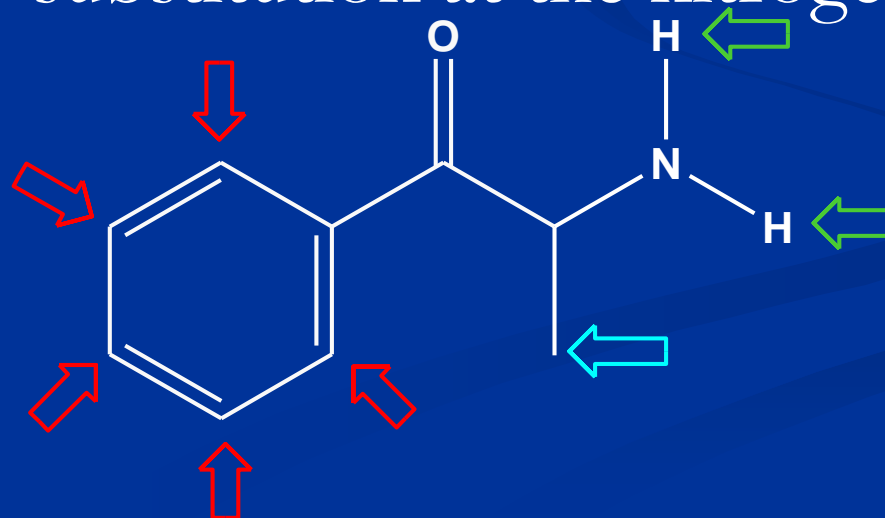


Cathinone Analogs

H & S 11375.5 (b), Oct 9, 2011

(2) 2-amino-1-phenyl-1-propanone (cathinone) or variation in any of the following ways:

- (A) By substitution in the phenyl ring
- (B) By substitution at the 3-position
- (C) By substitution at the nitrogen atom





Los Angeles Criminal Defense Attorney

Big Changes in California Sentencing Laws Coming October 1

»
County Jail Felony Sentence is Not Probation

Are Bath Salts Legal in California?

MDPV, Mephedrone 4 (aka 4-MMC), and Methylone (M1), the key ingredients in "Bath Salts" are, as of this writing, in legal limbo in California.

However, earlier this year, the Drug Enforcement Agency (DEA) has enacted their emergency authority to prohibit possession or sales of these compounds. The DEA has a year from the date of this "emergency hold" to decide whether or not to add bath salts to the list of Schedule I drugs.

From the [DEA press release](#) on the subject:

A Notice of Intent to temporarily control was published in the Federal Register today to alert the public to this action. This alert is required by law as part of the Controlled Substances Act. In 30 days or more, DEA intends to publish in the Federal Register a Final Order to temporarily control these chemicals for at least 12 months, with the possibility of a six-month extension. The final order will be published in the *Federal Register* and will designate these chemicals as Schedule I substances, the most restrictive category, which is reserved for unsafe, highly abused substances with no currently accepted medical use in the United States.

However in California, a recent law, codified under [Health and Safety Code 11375.5](#), was just enacted which makes it illegal to sell/distribute/give away any "any synthetic stimulant derivative", a misdemeanor offense. The target offense on this is going after stores who sell "bath salts." However, simple possession of these synthetic stimulants is not a crime (not to be confused with the criminal possession of numerous other stimulants under Health and Safety Code 11377).

What is curious is the broad language in the statute. After all, California already has Health and Safety Code 11378 which makes it a straight felony to sell a wide variety of controlled substances, stimulants such as MDMA and Amphetamine are some examples of stimulants covered by this statute.

Additional weirdness in 11375.5 is the specific exclusion of MDPV, which has been banned in other states and is widely agreed to be the predominate and problematic compound in bath salts. The likely reason for this is that the

Bail
Bath Salts
Criminal Defense
Domestic Violence
Drug Laws
DUI
Federal Crimes
Forfeiture Laws
Medicare Fraud
Money Laundering
Mortgage Fraud
Petty Theft
Plea Bargains
Probation Termination and Expungement
Questions Everybody Asks Criminal Defense Lawyers
Realignment
Search and Seizure
Sentencing
Sex Crimes
Three Strikes
Uncategorized

TOP 5 QUESTIONS ABOUT DOMESTIC VIOLENCE IN CALIFORNIA

Arrested for Shoplifting in California?
Five Things You Need to Know
Three Things You Can Learn From Peter Murphy's DUI Arrest
Proposition 36 Gives Inmates Serving Life In Prison A Chance At Reducing Their Sentence
Three Arrested On Suspicion Of Violating Federal Smuggling Laws

- Responses Posted Oct 29, 2011 from Defense Attorney
- Bath salt distribution a misdemeanor
- Insists that possession is not a crime
- Claims it excludes MDPV
- Surmises that the "legislature hopes that the ban on 'any synthetic stimulant derivative' is enough to cover their bases"

Cathinone Analogs and Synthetic Cannabinoid Laws

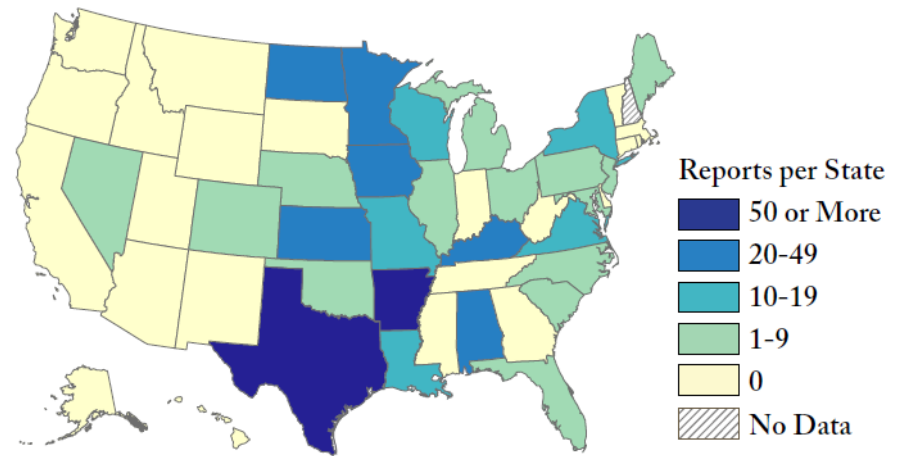
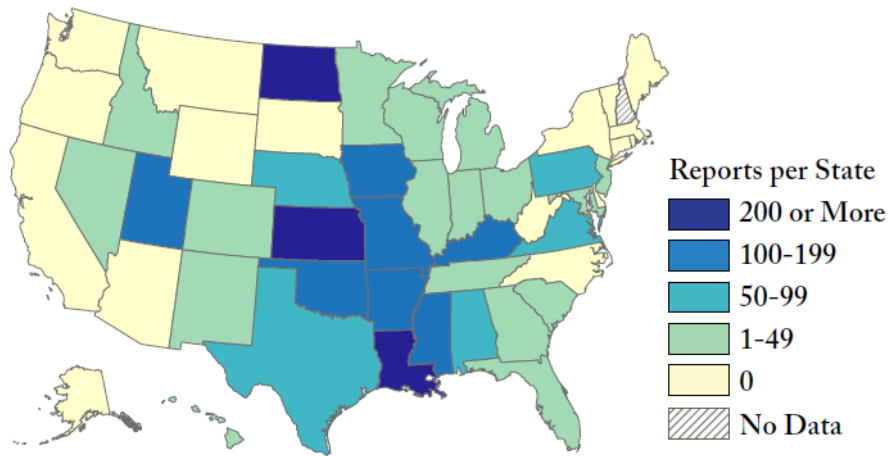
What about Possession?

Can we use H&S 11401 to charge Possession as a
Felony

if H&S 11357.5 and 11375.5 call Sales a
Misdemeanor?

Caseload

NFLIS 2010



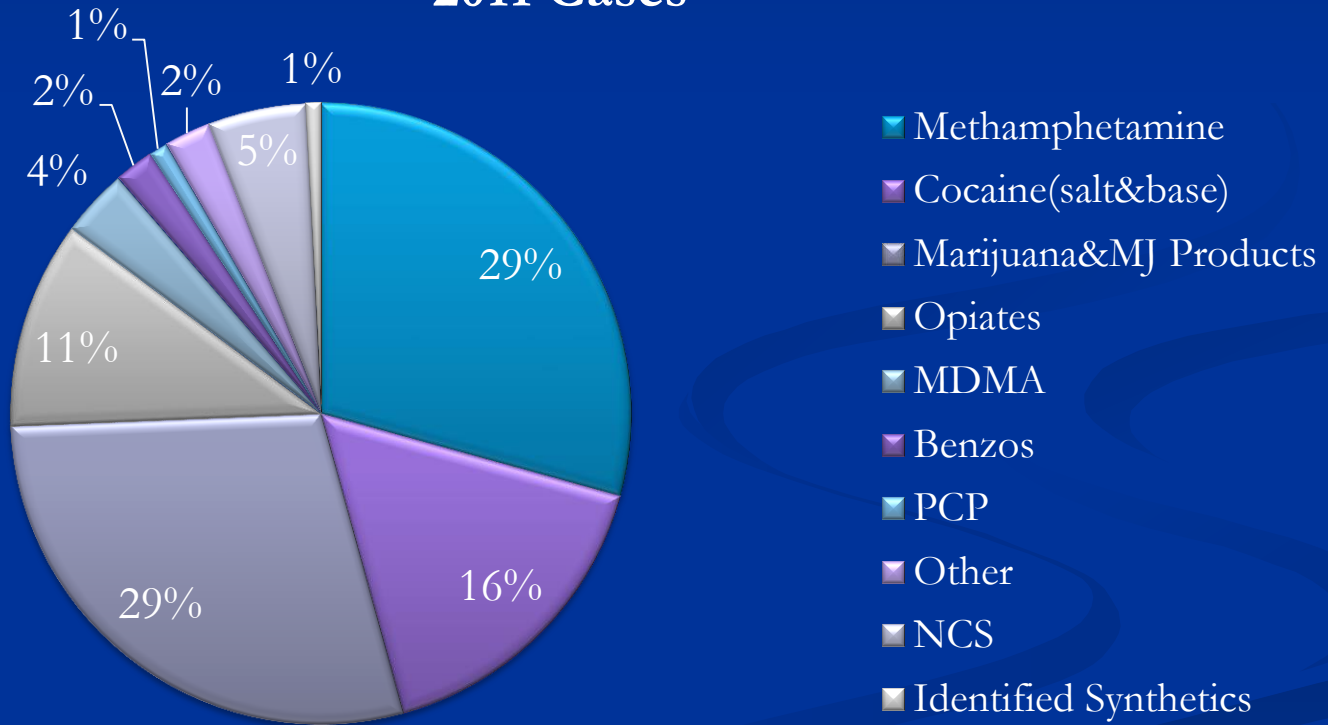
2977 Total Synthetic Cannabinoids

628 Total Synthetic Cathinones



Cross-section of Casework, LA

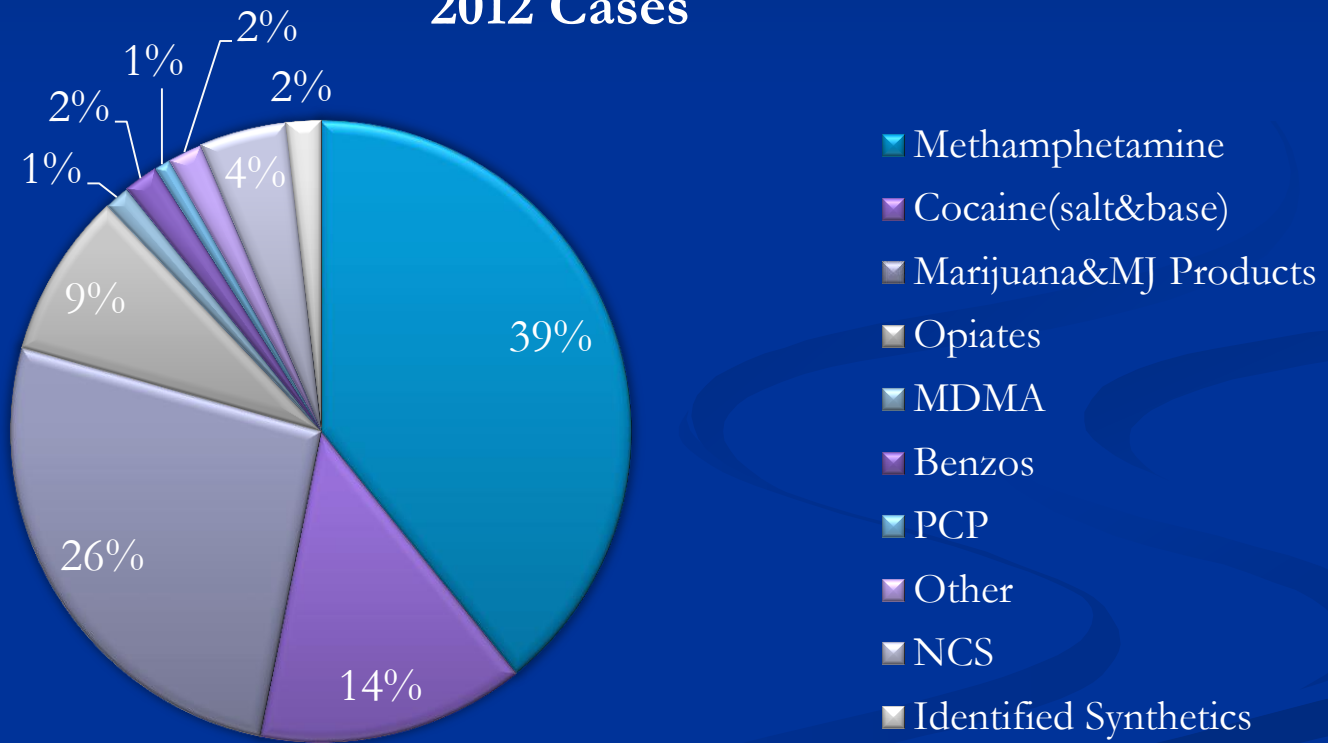
2011 Cases





Cross-section of Casework, LA

2012 Cases





“Ecstasy” Tablets: The Shift From MDMA

Benzylpiperazine (BZP)
3-Trifluoromethylphenylpiperazine (TFMPP)

Methylone (bk-MDMA)
Butylone (bk-MBDB)

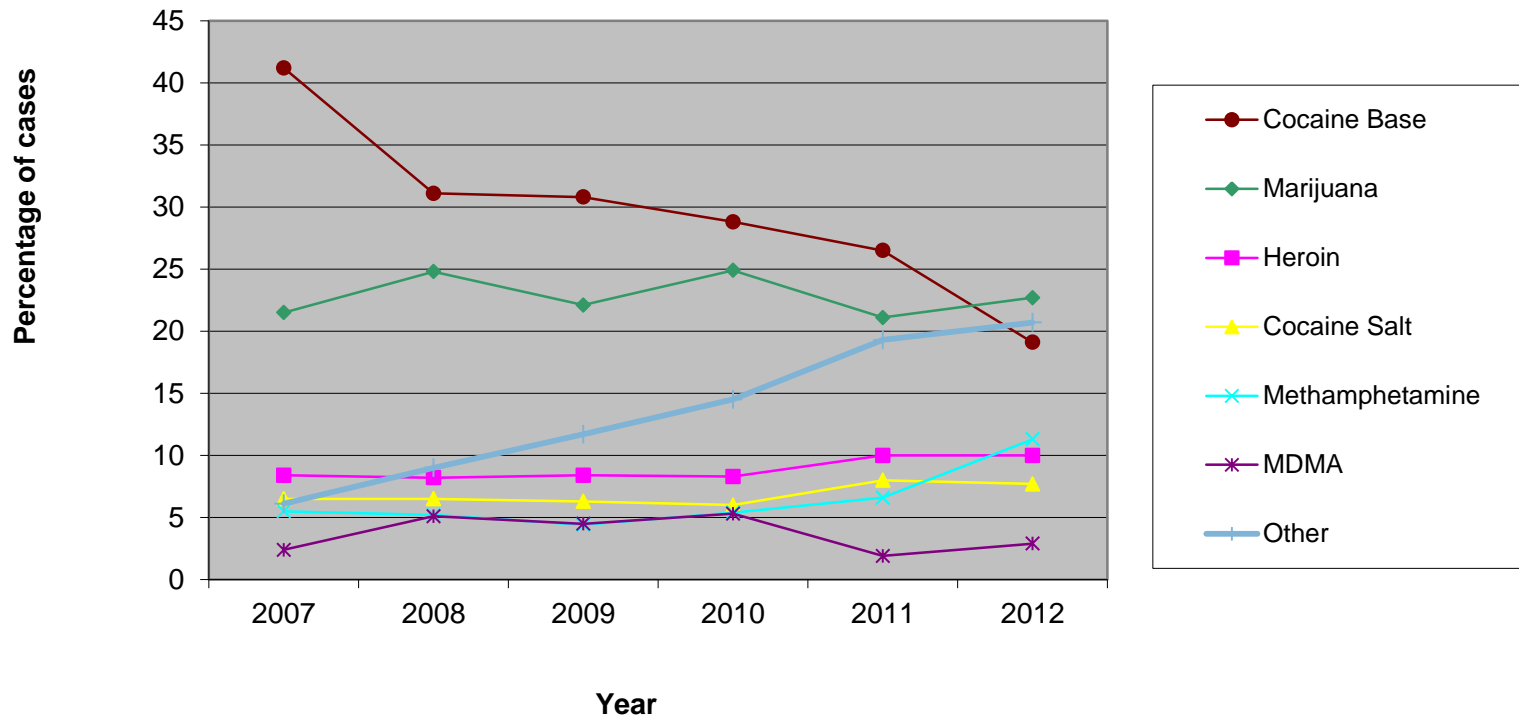


α -Pyrrolidinovalerophenone (α -PVP)
3,4-methylenedioxypropylvalerone (MDPV)
4-methylmethcathinone (mephedrone)
2,5-dimethoxy-4-iodophenethylamine (2C-I)
4-fluoromethcathinone (4-FMC)
N,N-diisopropyl-5-methoxy-tryptamine (5-MeO-DIPT)
4-bromo-2,5-dimethoxyphenethylamine (2C-B)
Methoxetamine

Etc...

Oakland Drug Submissions 2007-2012

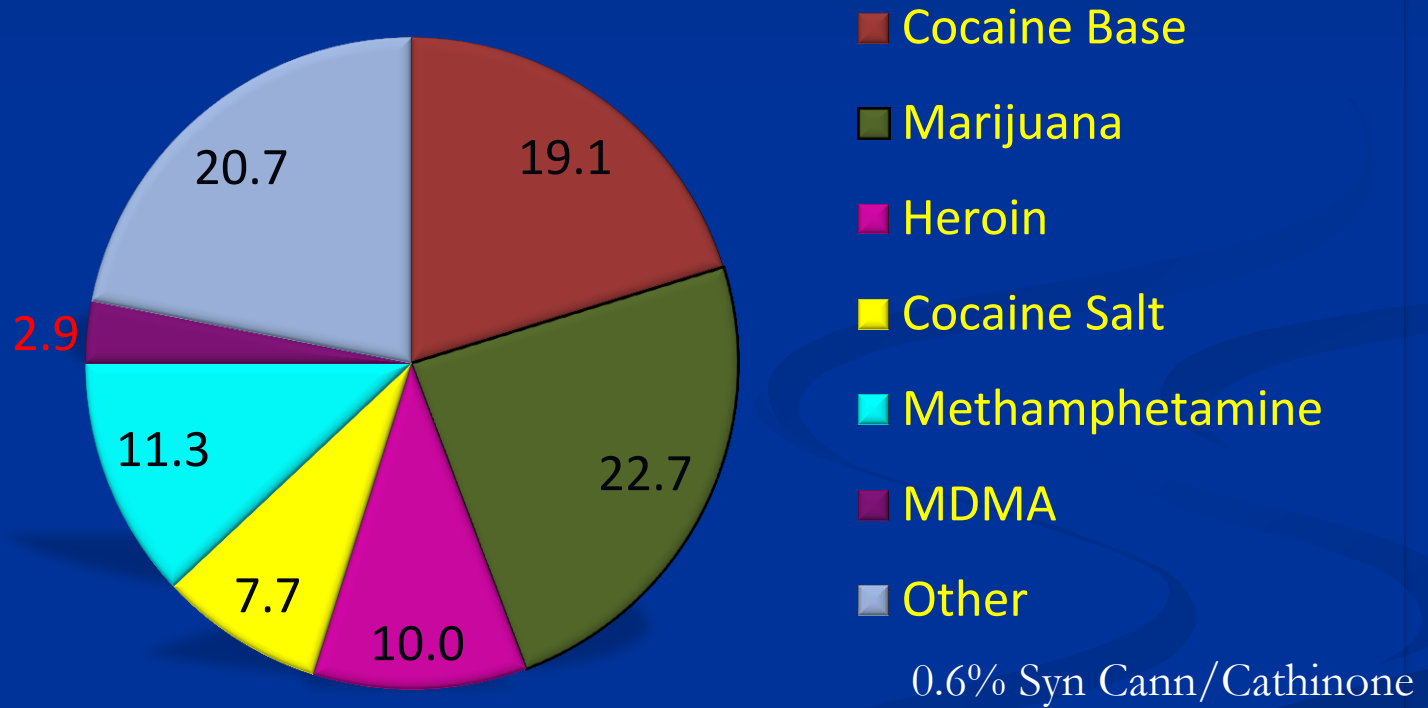
Oakland's Top 5 Drugs





Oakland PD

2012



Northern California

■ Oakland PD

- 6 out of 1000 Bath Salts 2012
- 1 out of 1000 Syn Cann 2012/ 5 out of 1000 2013

■ Santa Clara

- 20-30 out of 4000 Bath Salts ~ 5-8 out 1000
- 2 – 5 out of 4000 Syn Cann ~ 1 out of 1000

■ Santa Rosa 2 cases last year

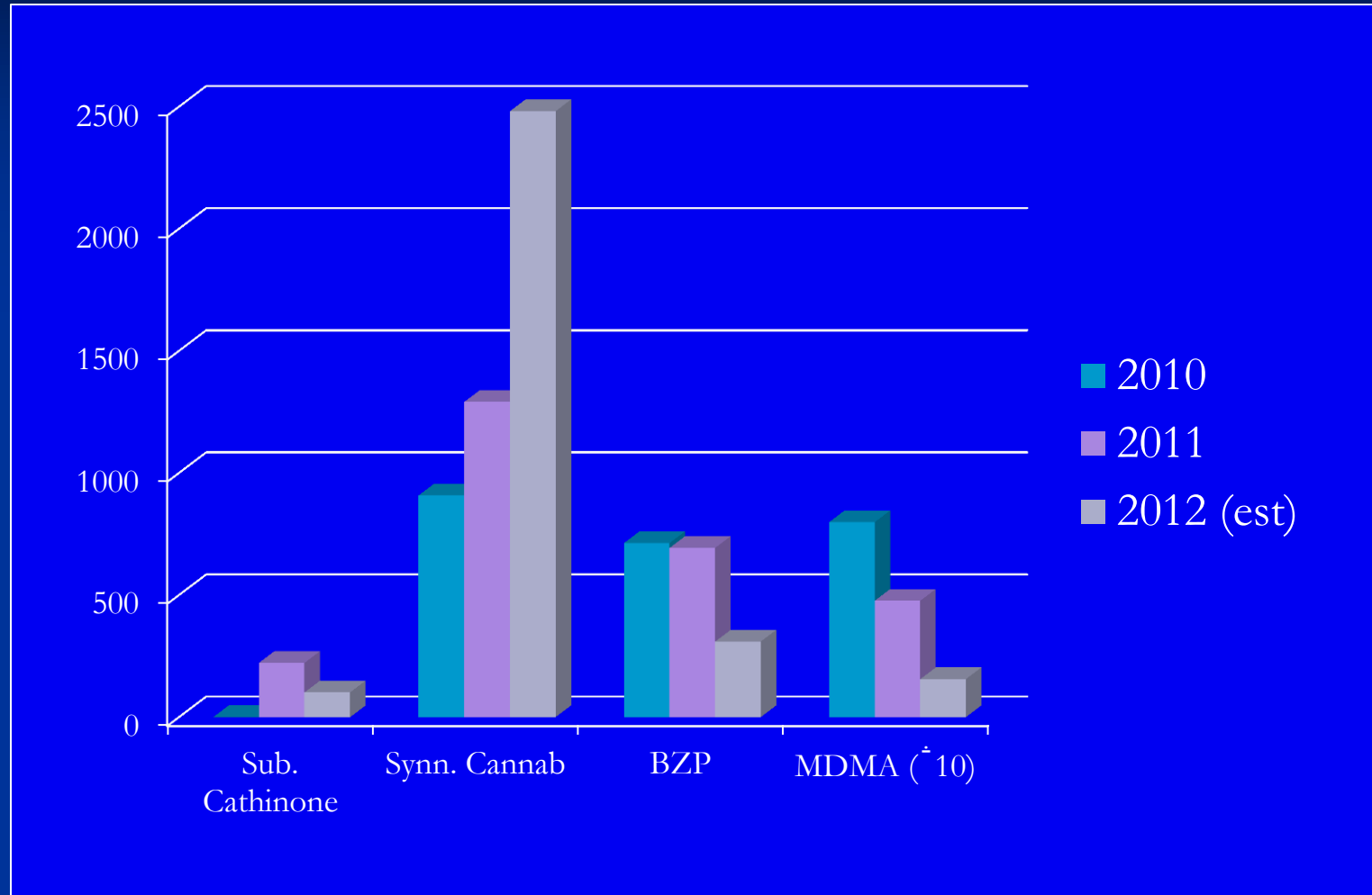
■ Redding

- 2 out of 1000 Bath Salt / Syn Cann from the State Prisons

Southern California

- LASD
 - 10 out of 1000 in 2011
 - 20 out of 1000 in 2012
- LAPD a handful, they track them as “other”
- OC SD toxicology laboratory
 - THC+ 30/week; don't look for synthetics
- LA County Coroner
 - Only look for synthetic cann/bath salts if requested

West Statistics



Source: NFLIS 2010/2011 Annual Reports, 2012 Midyear Report

Brand Names

- “Bath Salts”

- Dragon

White Girl

- Synthetic Cathinones more often submitted as capsules or tablets

- Synthetic Cann

- Sexy Herbal Sachet

King Cobra

- Funky Green Stuff

Funky Monkey 2

- Mr. Big Shot

Fan Kush

Kush Apple

- OMG Herbal Potpourri

Master Kush

- Diablo Botanical Incenses

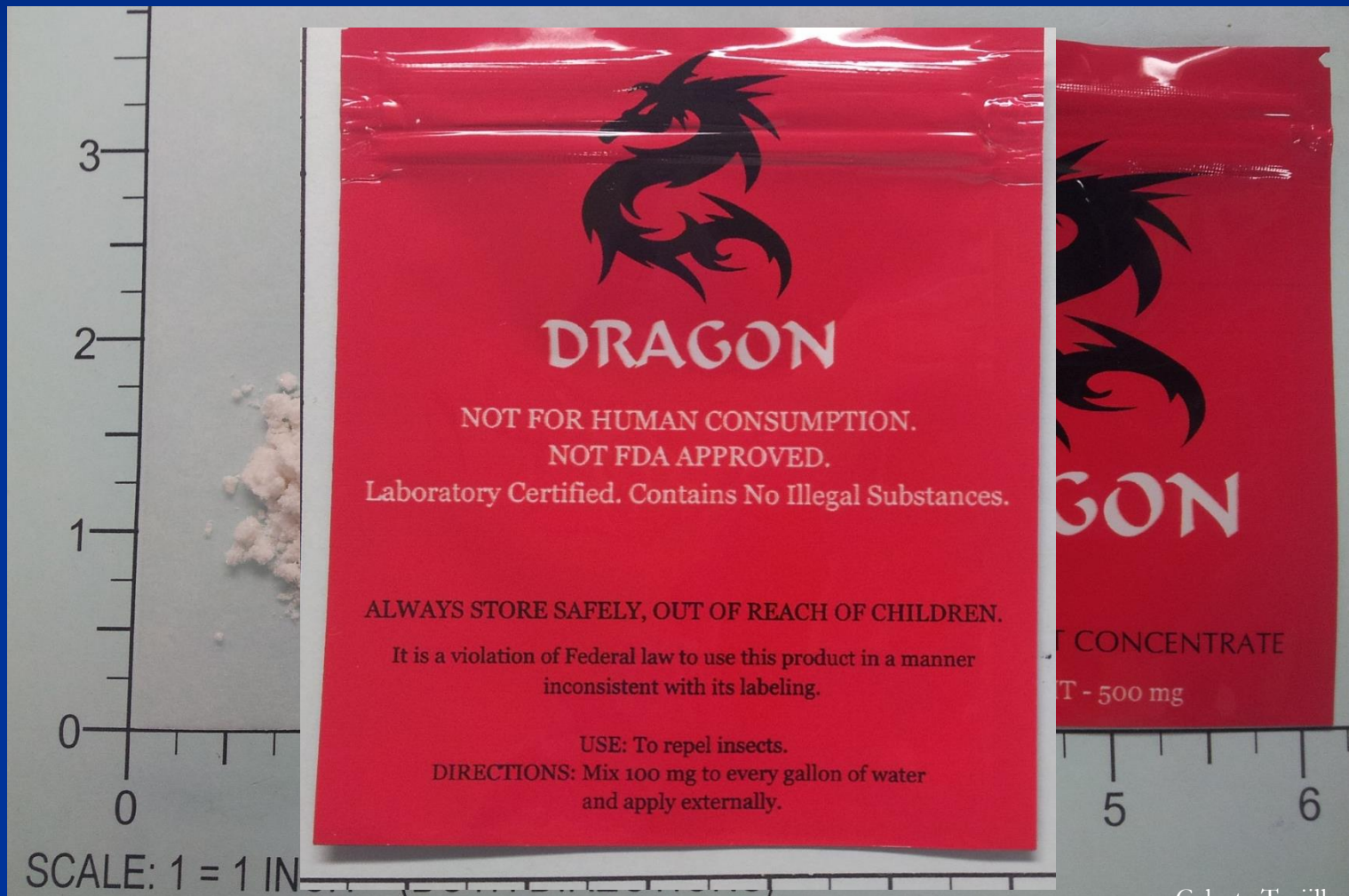
Zombie World

- G-13 potpourri

Darkness Botanical Blend

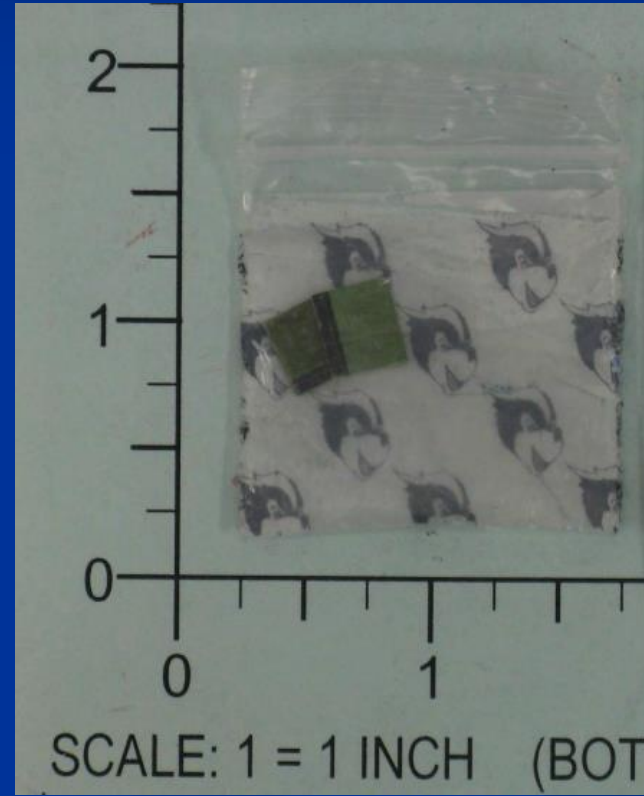


“Bath Salts” Powder





Synthetics on Blotter Paper



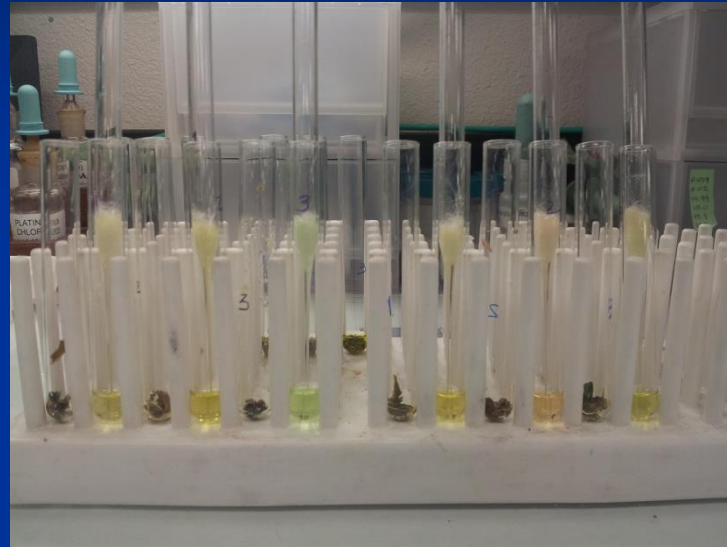
2-(4-iodo-2,5-dimethoxyphenyl)-N-[(2-methoxyphenyl)methyl]ethanamine (25I-NBOMe)



Analytical Considerations



Synthetic Cannabinoids



Sample 1: AM 2201

Sample 2: AM 2201

Sample 3: JWH-122, AM 2201

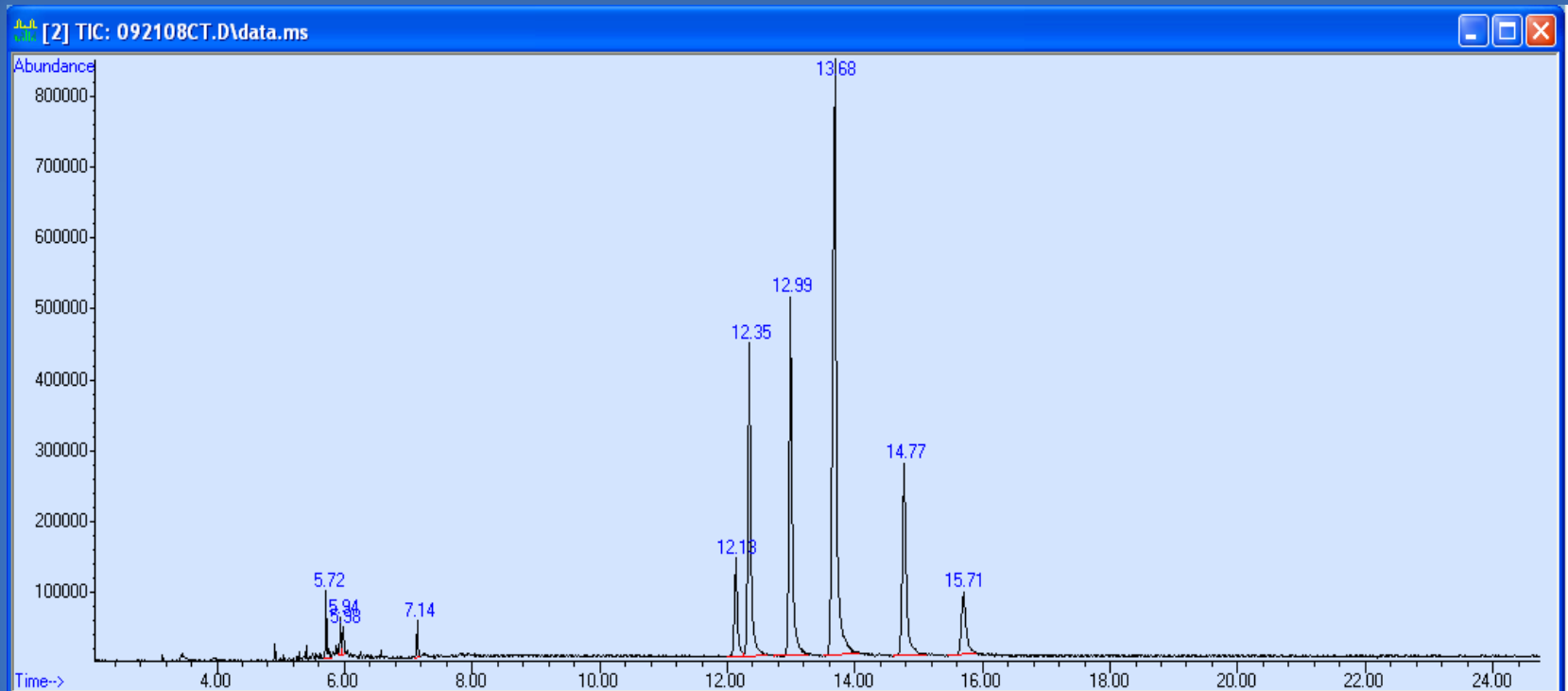
Sample 4: AM 2201, JWH-122, JWH-210

Sample 5: AM 2201, JWH-122, JWH-250

Sample 6: AM 2201, JWH-122, JWH-210, MAM 2201, AM1248, AM 1241



Synthetic Cannabinoids

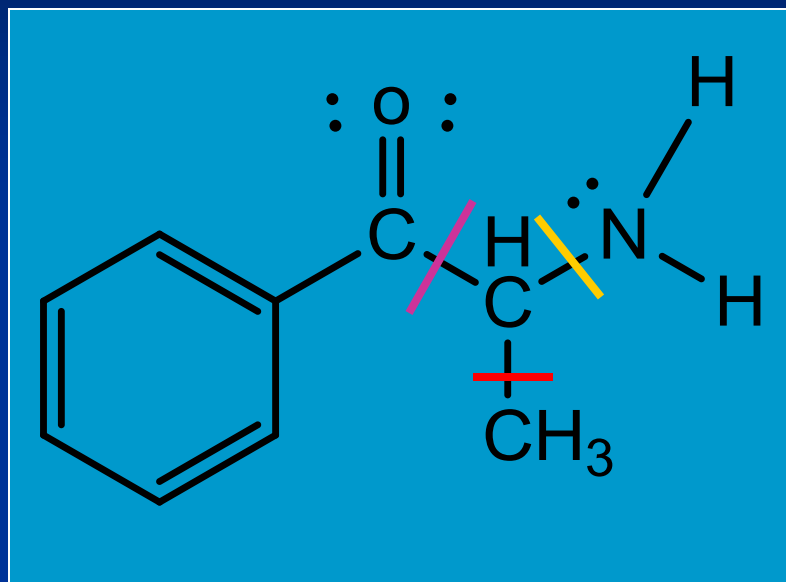


AM 2201, JWH-122, JWH-210, MAM 2201, AM1248, AM 1241

Analyzing MS Peaks in Drug Samples: 3 Approaches

1. Sigma Bond Cleavage
2. Isotopic Contribution Analysis
3. Detailed Fragmentation Analysis
 - Consideration of Ionization Site

1st approach: Sigma Bond Cleavage



$$\begin{array}{r} 149 \\ -15 \\ \hline 134 \end{array}$$

$$\begin{array}{r} 149 \\ -16 \\ \hline 133 \end{array}$$

$$\begin{array}{r} 149 \\ -44 \\ \hline 105 \end{array}$$

$$\begin{array}{r} 149 \\ -105 \\ \hline 44 \end{array}$$

Analyzing MS Peaks in Drug Samples: 2nd Approach

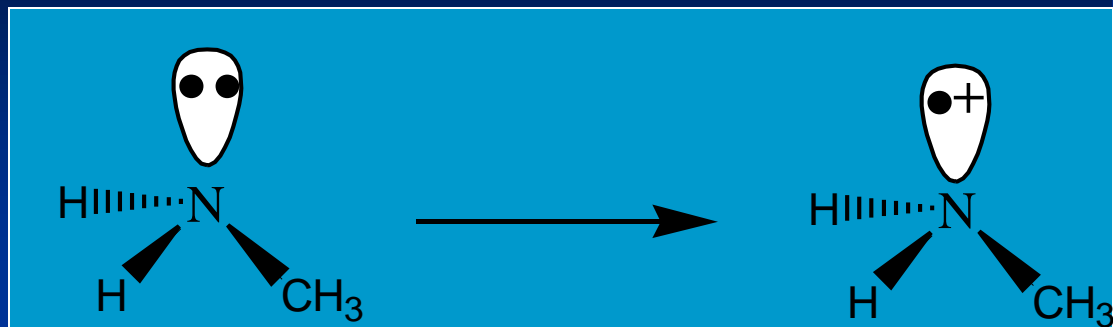
- Determine elemental composition of fragments based on isotope peak ratios
- Pick peak of interest 'X'
- Assign elements with X+2 isotopic contribution
 - Except O
- Assign elements with X+1 isotopic contribution
- Assign number of O
- Determine number of rings and double bonds
- Determine empirical formula, then propose structure(s)
- Does the structure make sense?

References: Sparkman OD, Mass Spec Desk Reference, 2000.

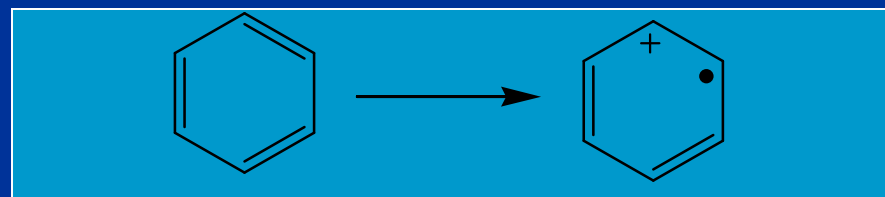
McLafferty and Turecek "Interpretation of Mass Spectra" 4th edition (1993), Ch. 2

Ionization Potentials

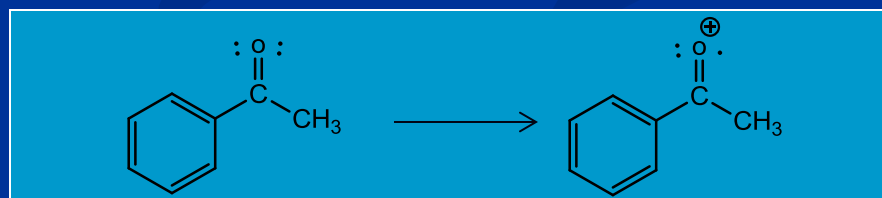
- Nitrogen lone pair
 - 8.97 eV for CH_3NH_2



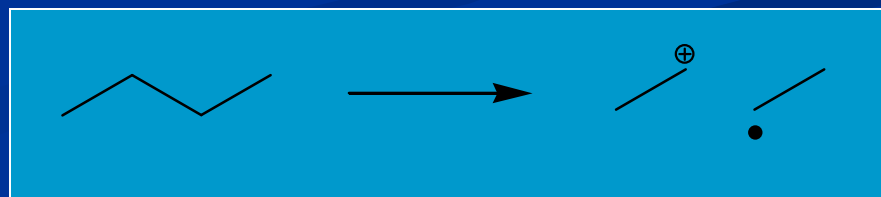
- Benzene π electrons
 - 9.25 eV for C_6H_6



- Oxygen non-bonding e-
 - 9.3 eV for C=O next to Ph



- Sigma electrons
 - 10.63 eV for butane



Ease of Ionization

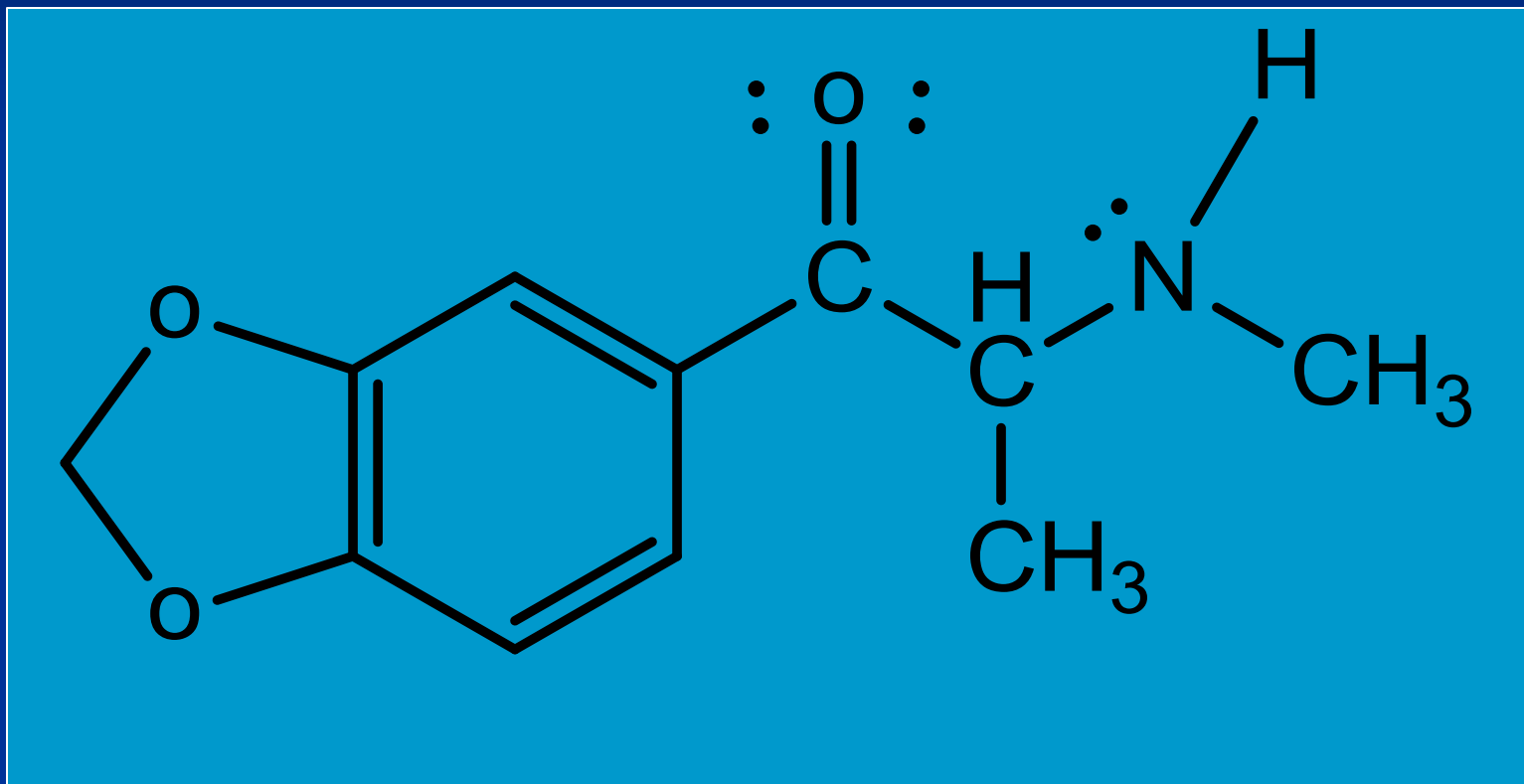
Non-bonding electrons >

π electrons >

σ bond

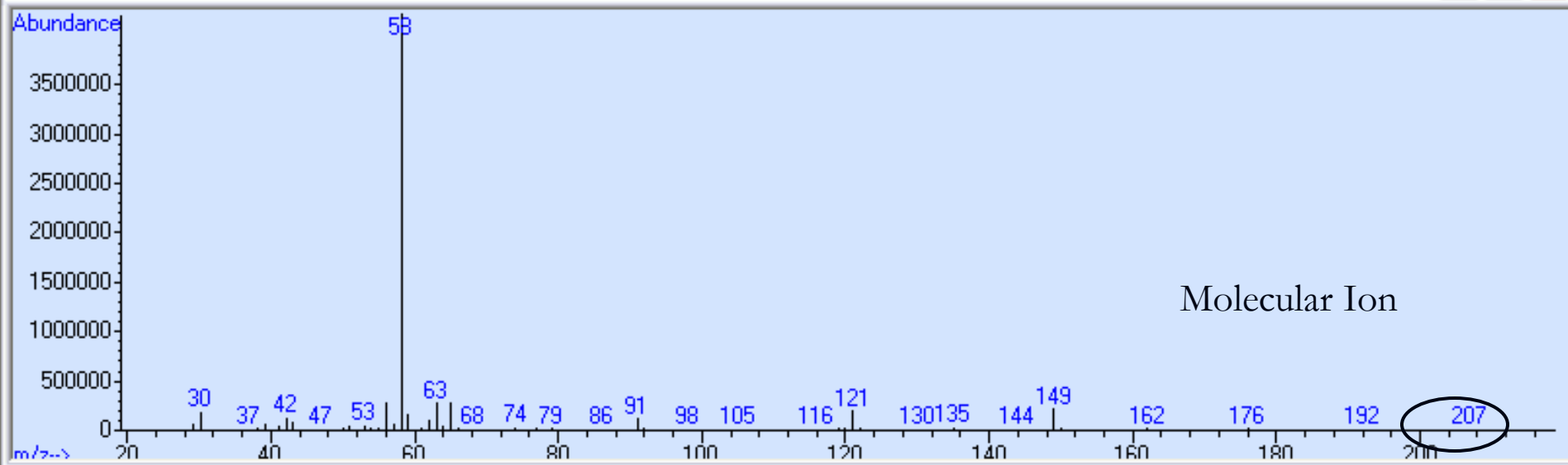
Methylone

(3,4 methylenedioxyamfetamine)



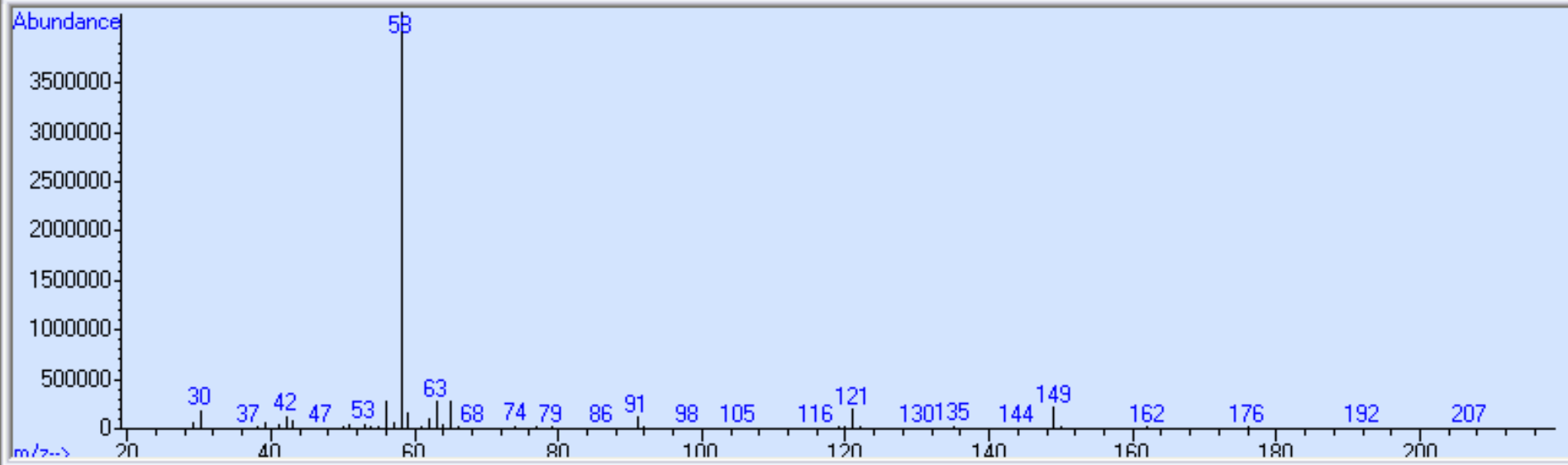
MW = 207 g/mol

[1] Scan 1432 (8.310 min): GROUP2Methylone.D\data.ms



Ready

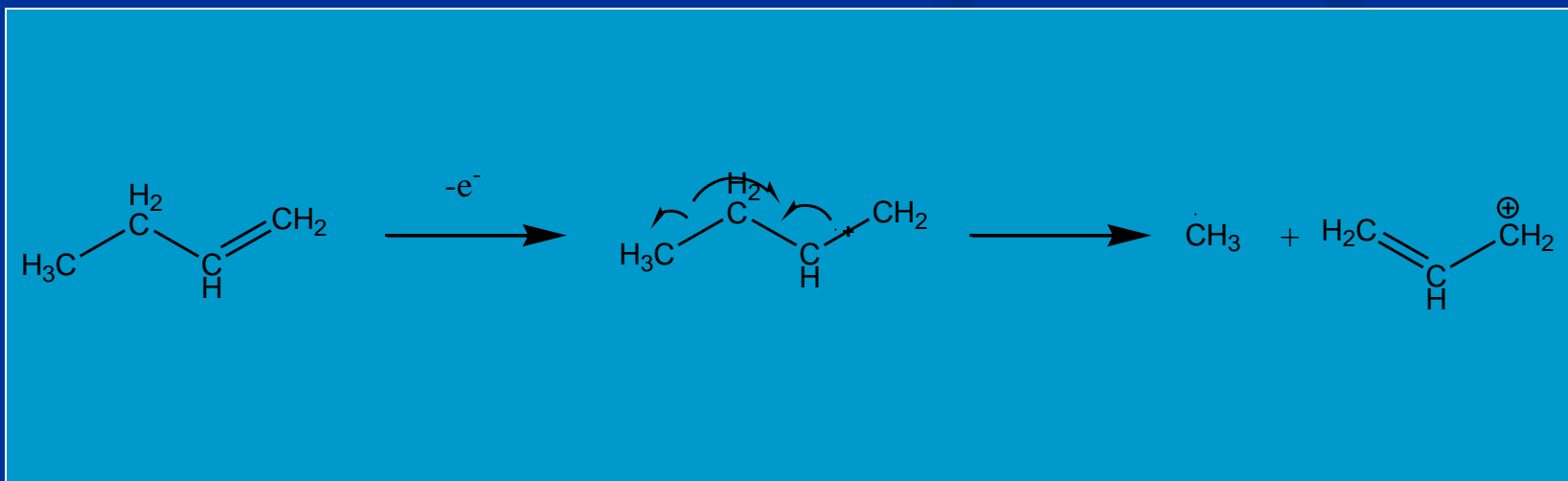
[1] Scan 1432 (8.310 min): GROUP2Methylone.D\data.ms



Ready

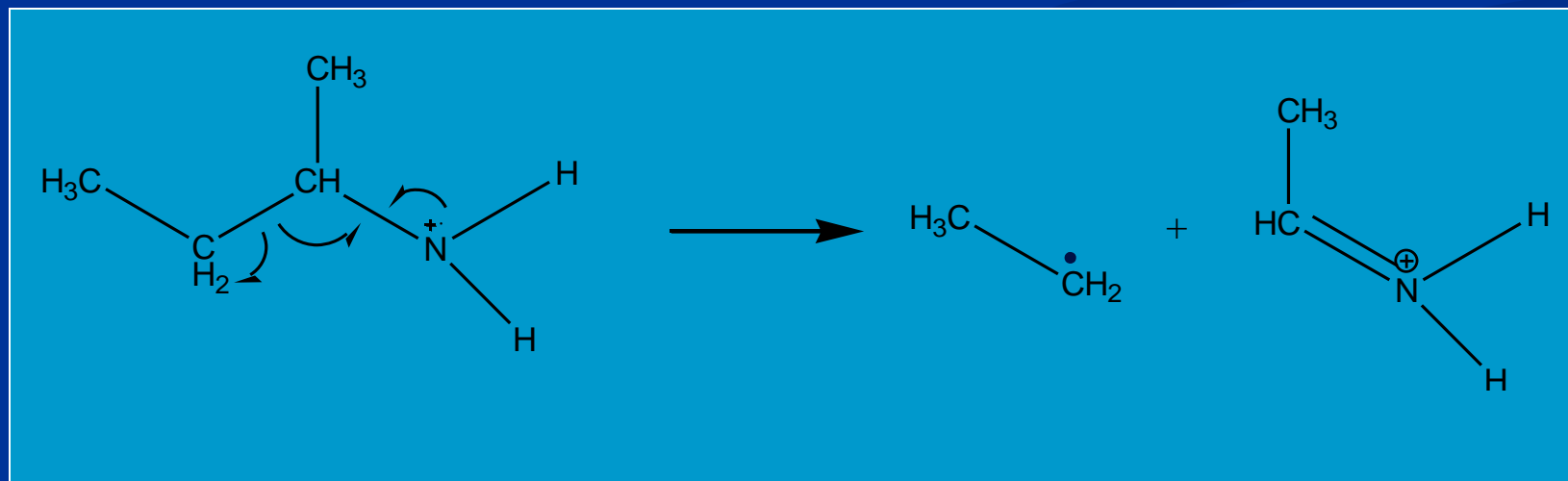
Homolytic Cleavage

- Occurs with radical cations
- Radical site initiation
- The charge is retained on the original site
- Movement of single electrons characteristic
- $\text{OE} \rightarrow \text{radical} + \text{EE}$
- Tendency for homolytic cleavage:
 - $\text{N} > \text{O}, \text{S}, \pi, \text{R}\cdot > \text{Cl}, \text{Br} > \text{H}$



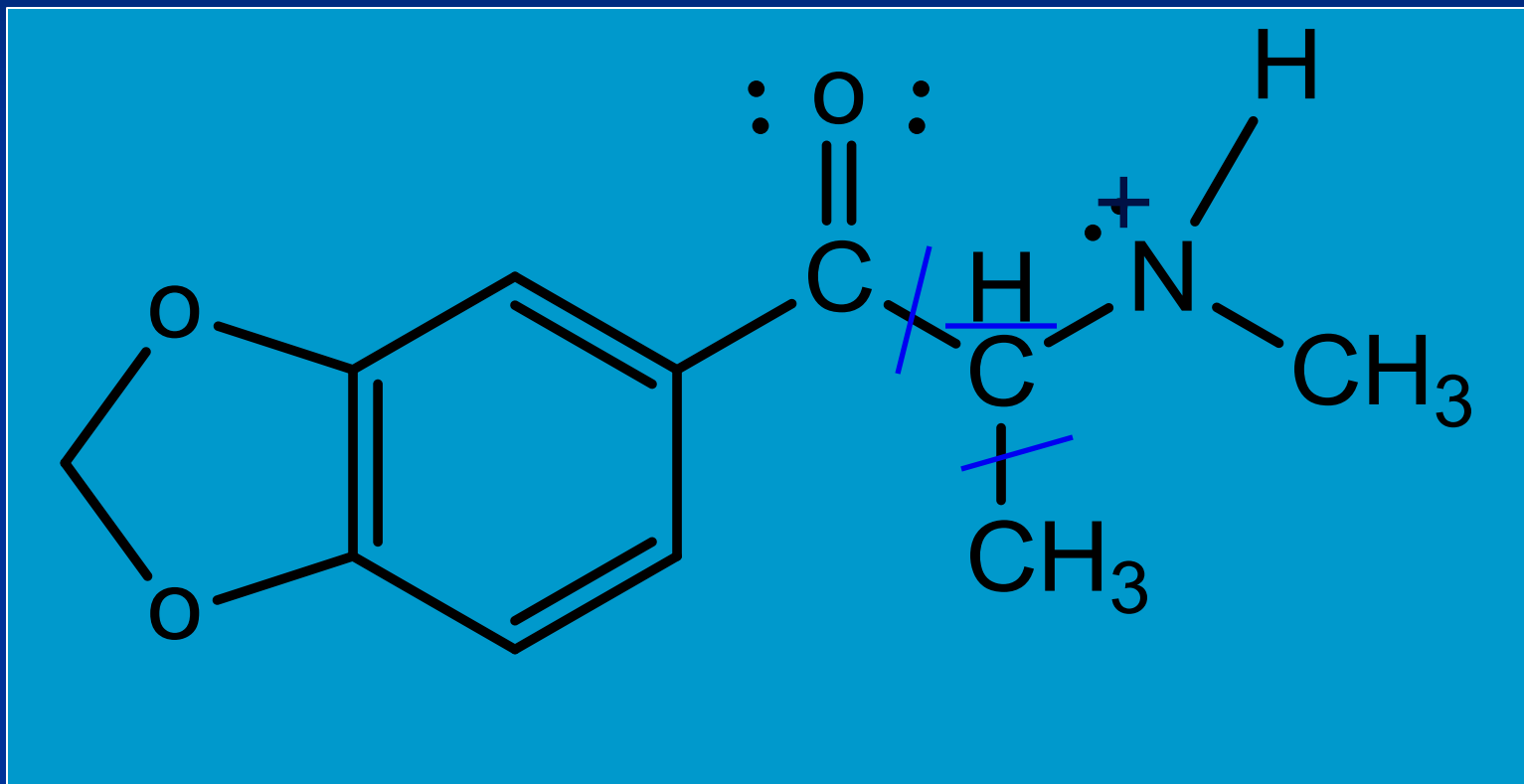
Homolytic Cleavage: Special Case

- α -cleavage
- Occurs on bond of C adjacent to N^+
- $OE \rightarrow$ radical + EE



Methylone

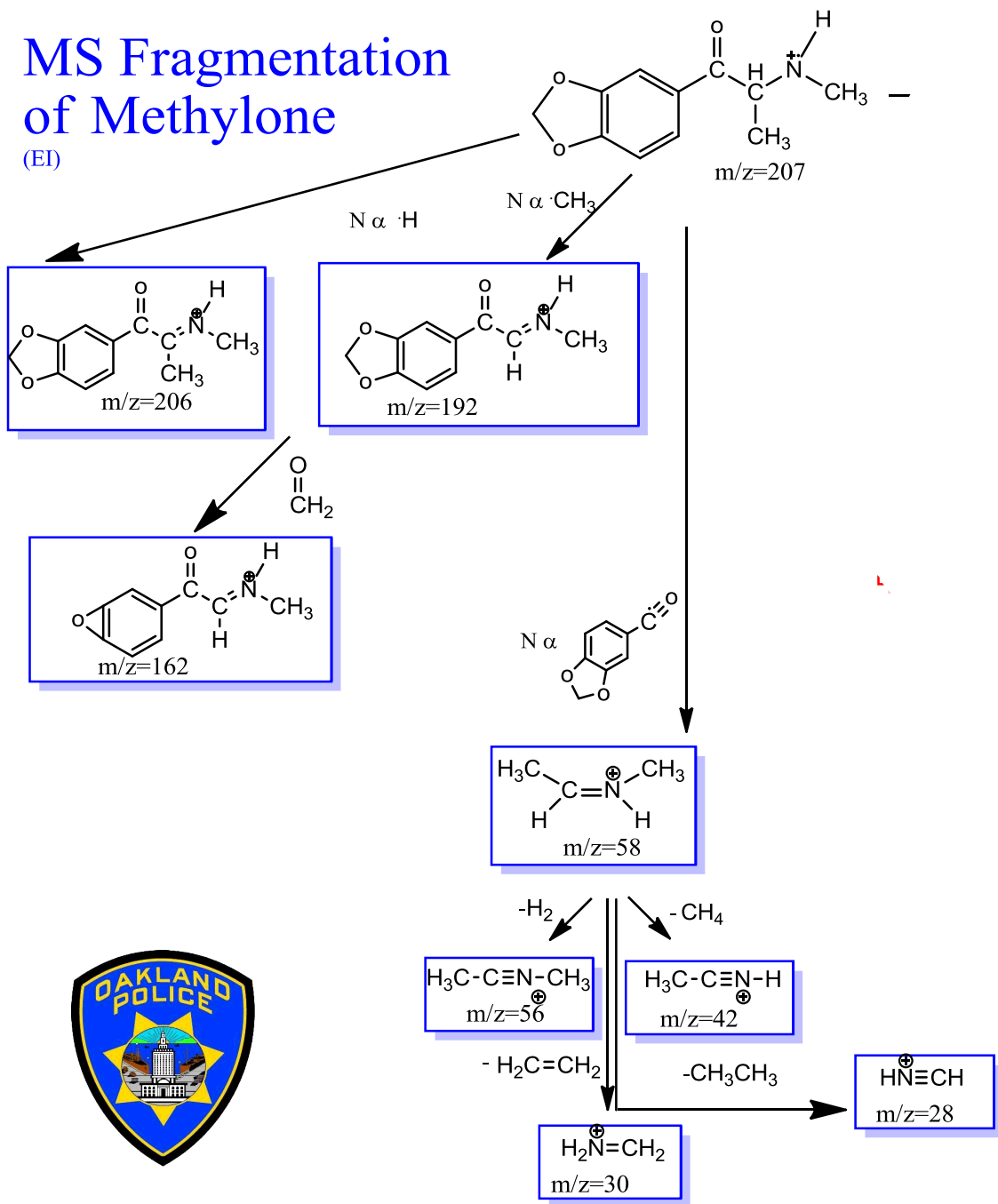
(3,4 methylenedioxyamfetamine)

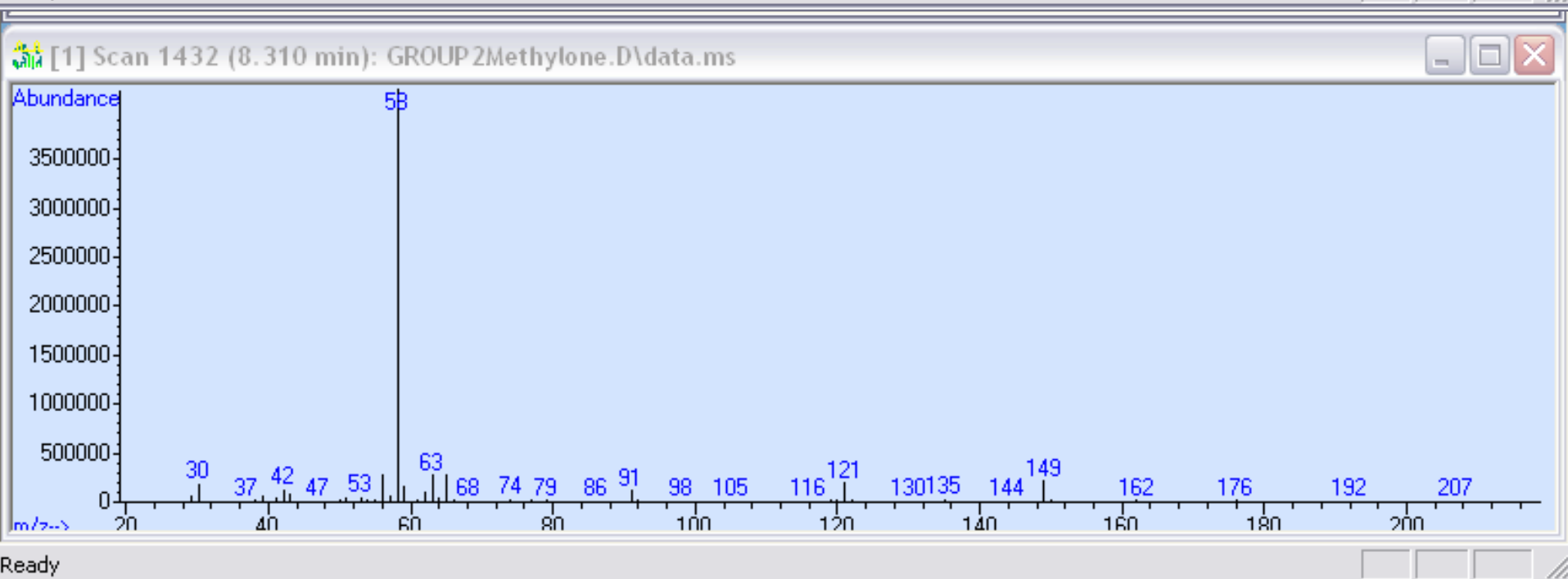
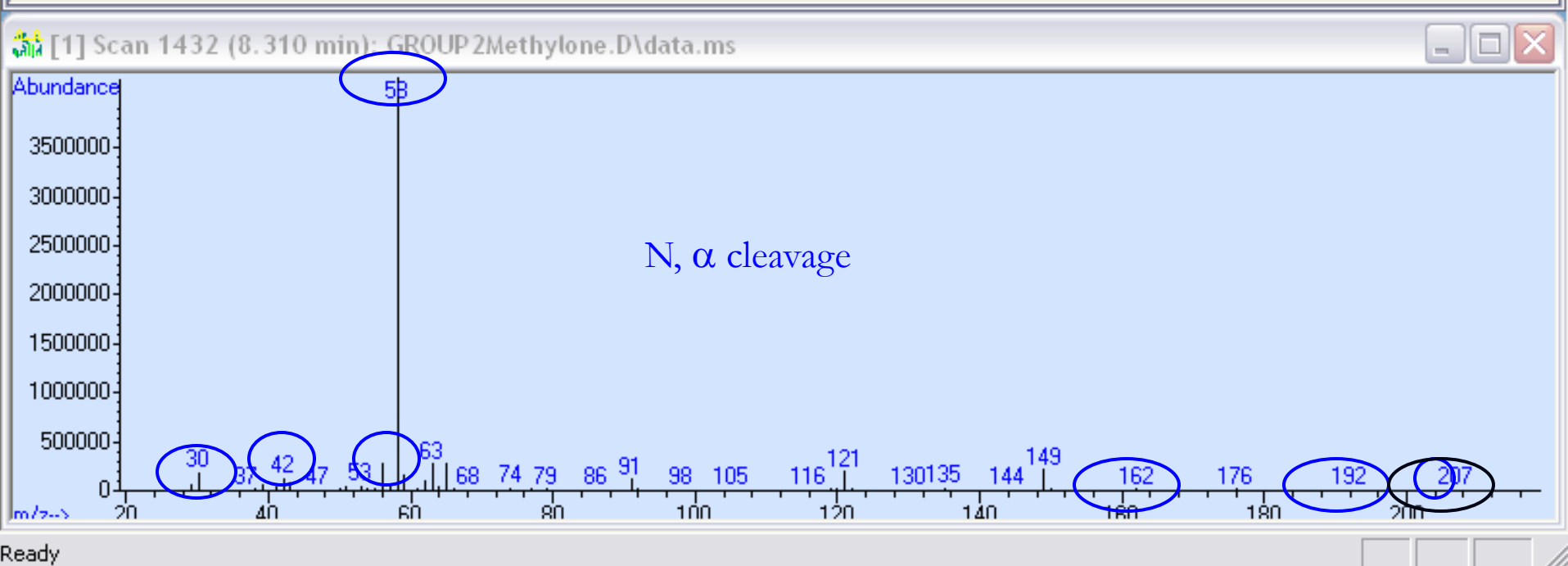


MW = 207 g/mol

MS Fragmentation of Methylone

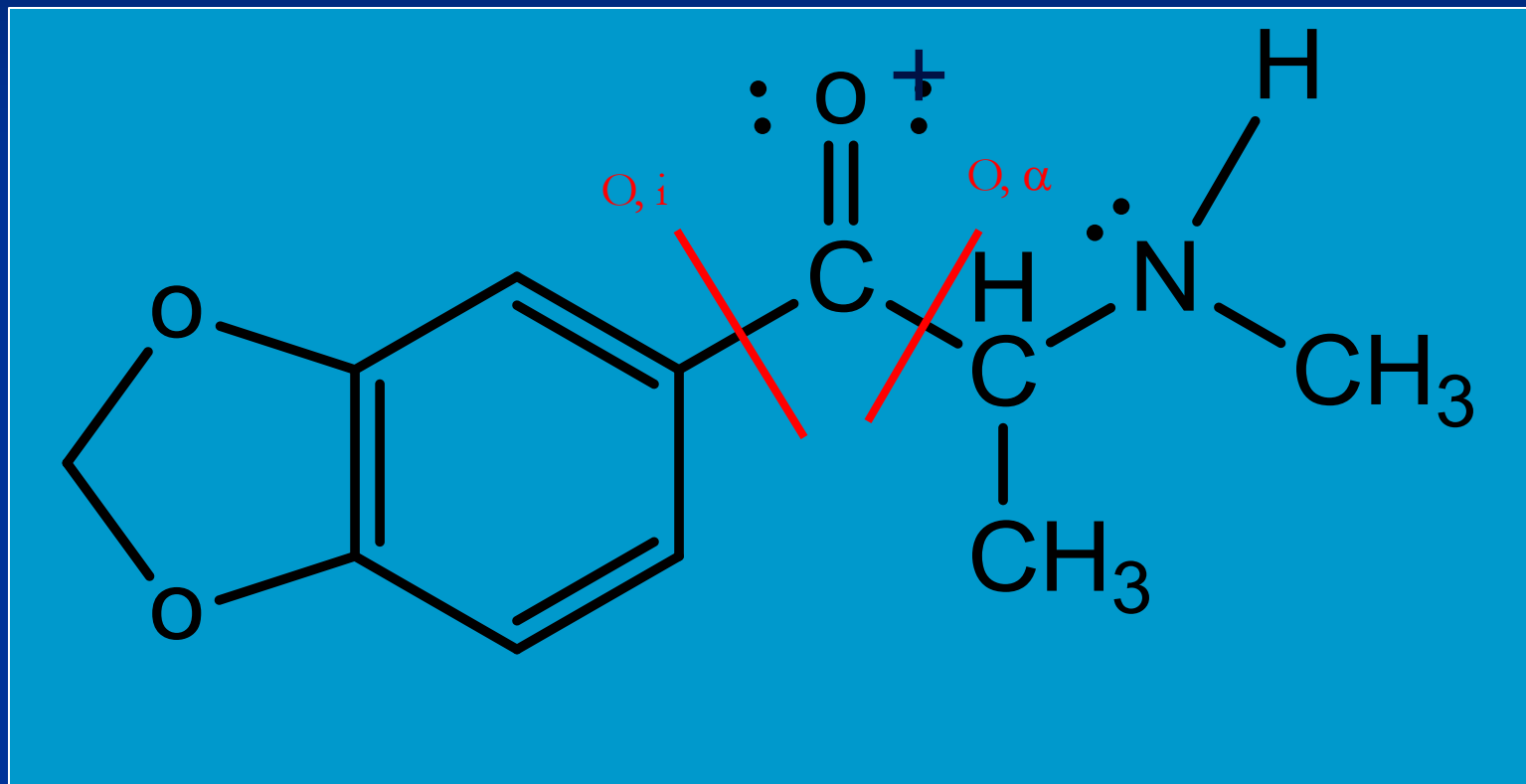
(EI)





Methylone

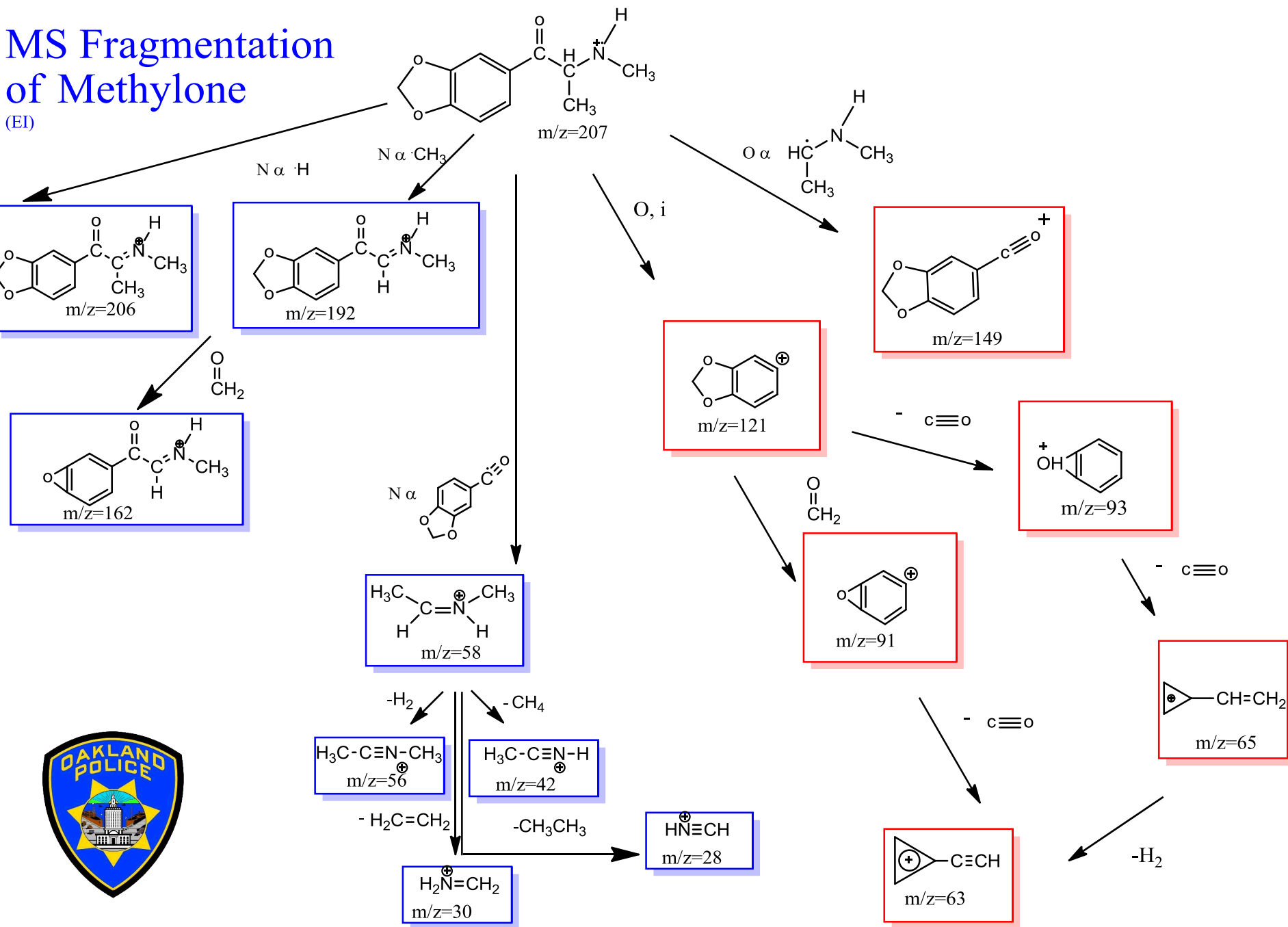
(3,4 methylenedioxyamfetamine)

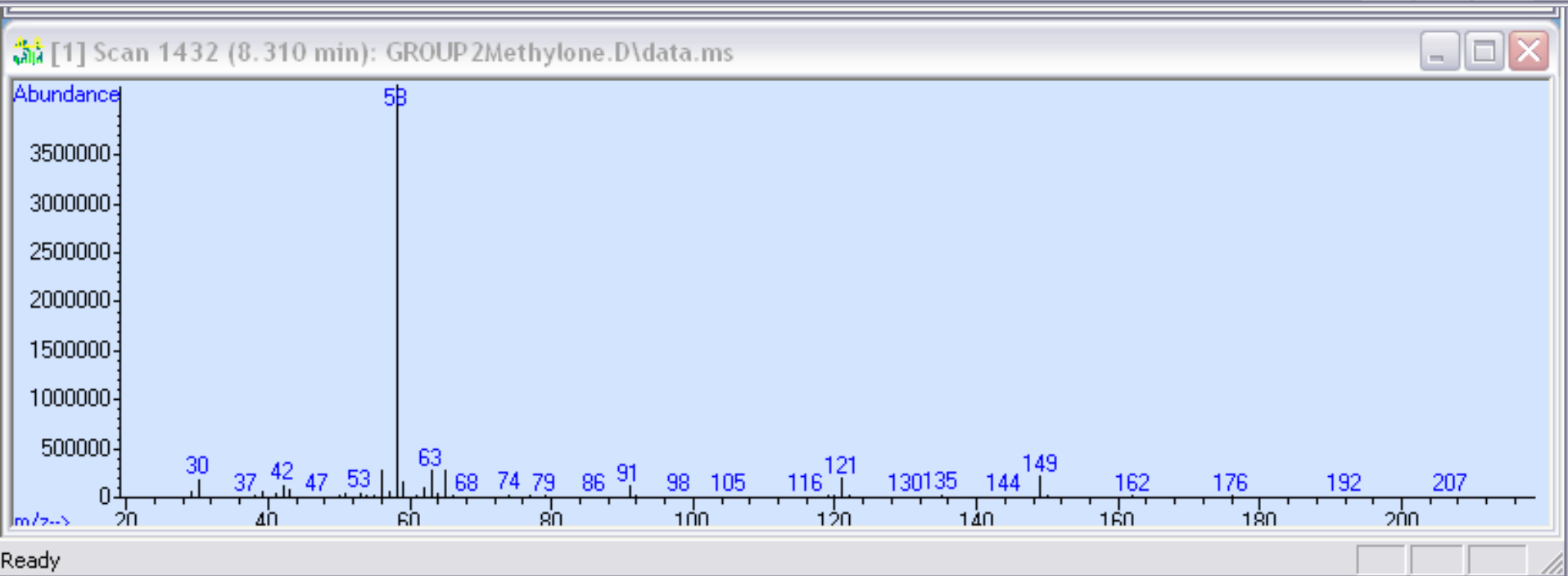
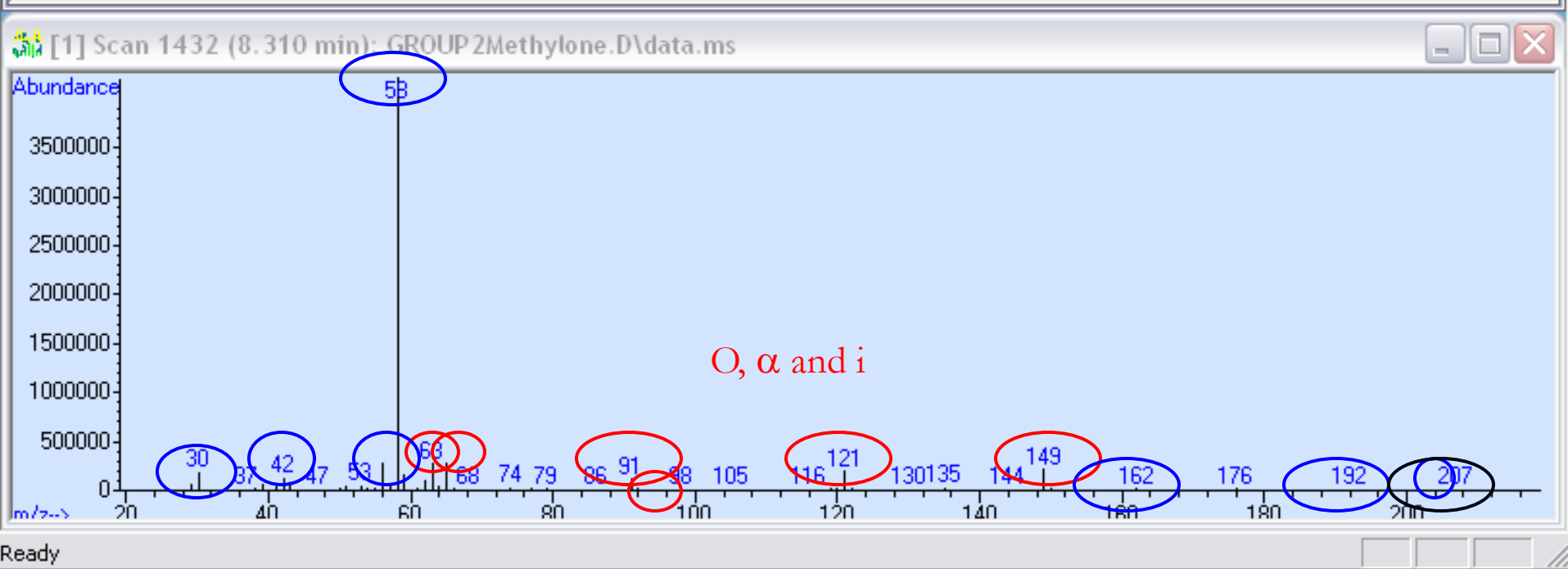


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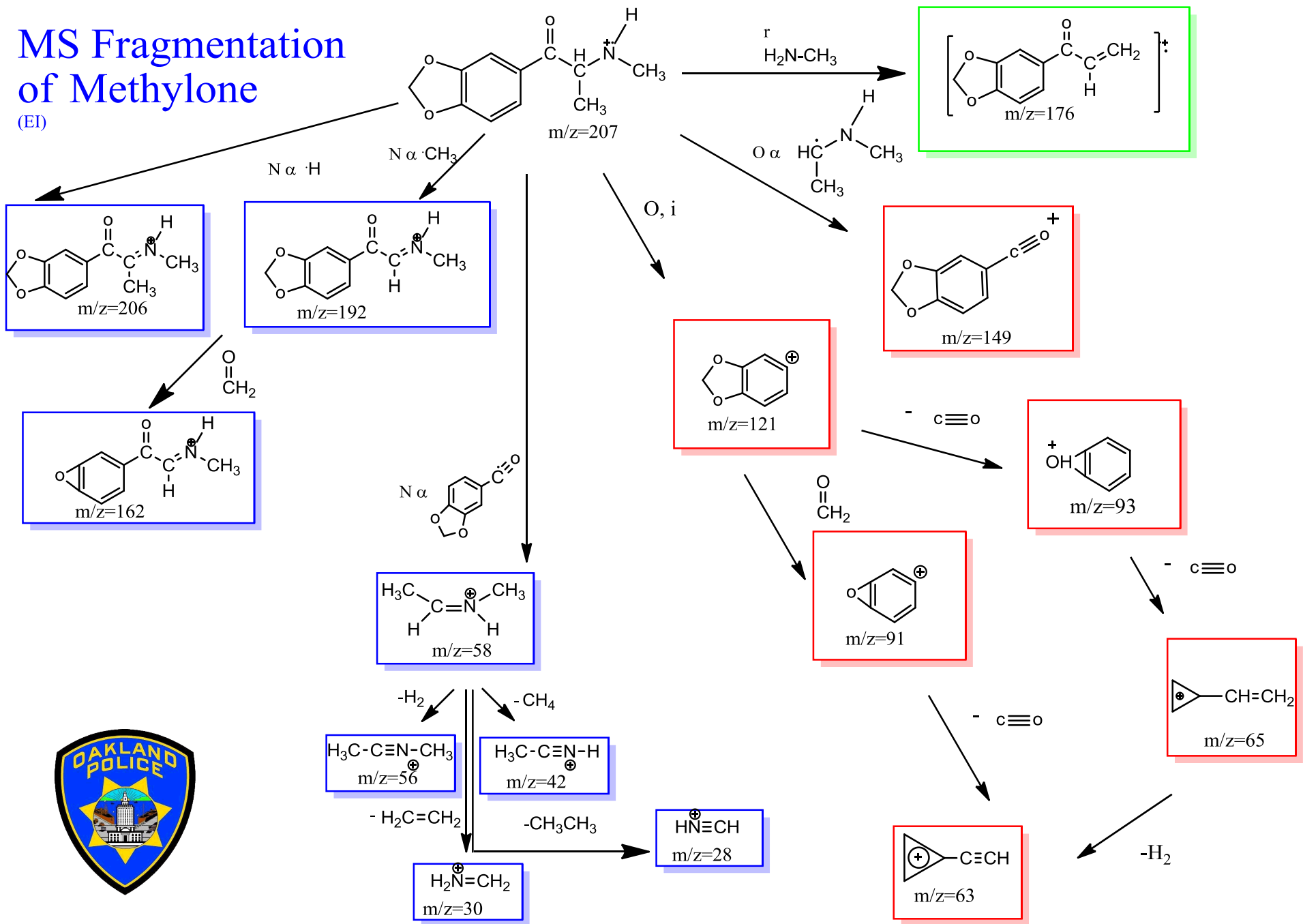
(EI)

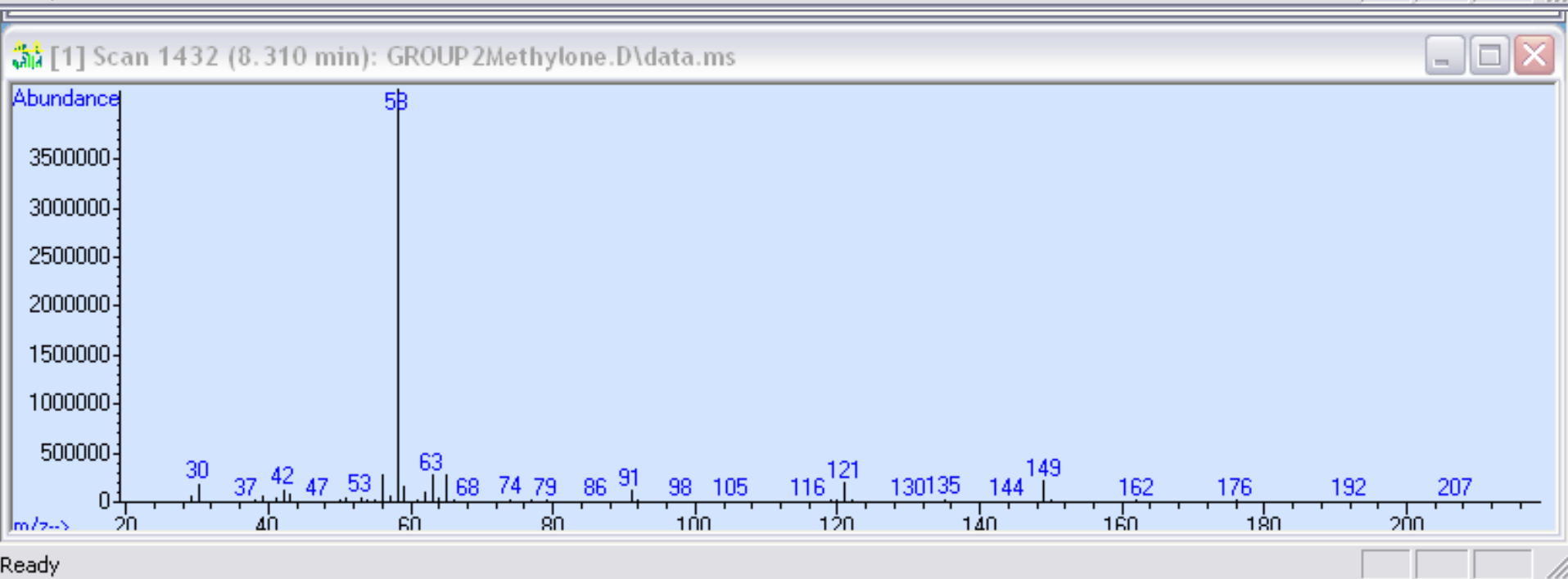
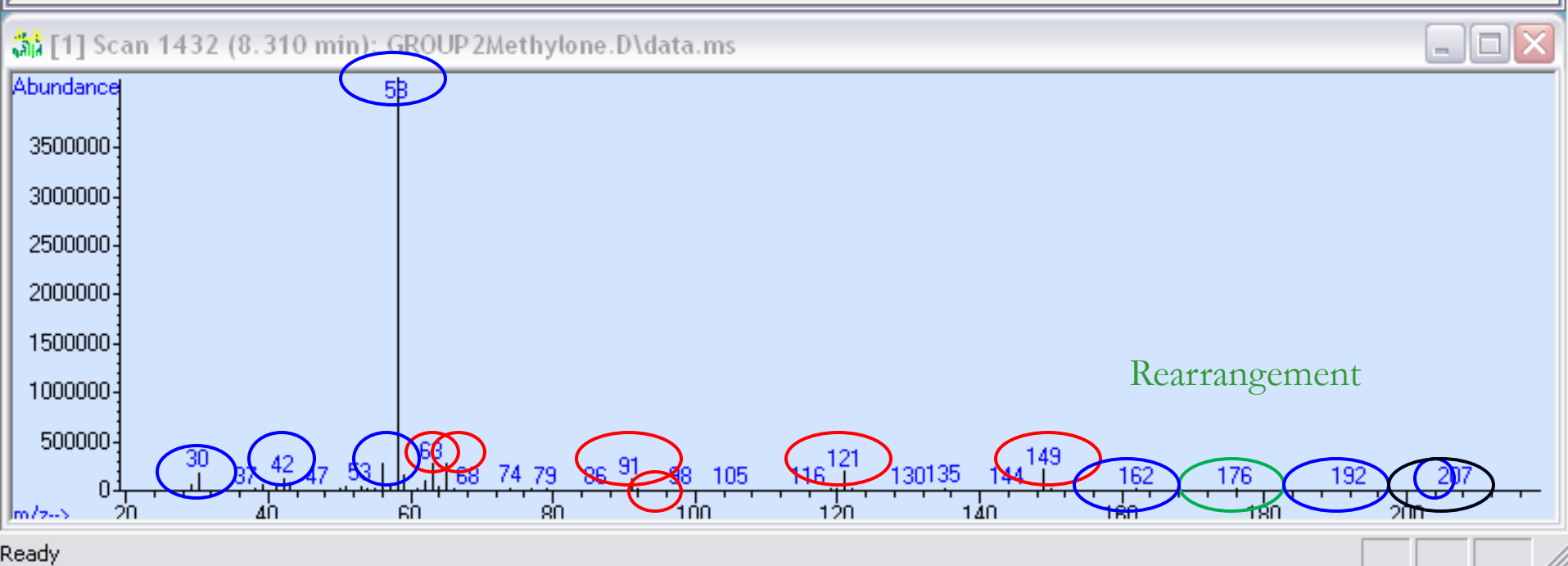




MS Fragmentation of Methylone

(EI)





Reporting Results

Short survey of California Labs

Requests for anonymity made

When there is a lack of a standard

- Reports “indicate” a compound, but do not confirm without reference material on hand
- “XLR, a synthetic cannabinoid, is indicated per literature reference standard spectra from SWGDRUG database and Forendex website. The material was not confirmed because a reference standard was not available. Please contact the laboratory if confirmation is required.”

When there is a lack of a standard

- “...was chemically analyzed and appears to contain **AM2201**. This preliminary conclusion is based upon comparison of the sample spectrum to a reference spectrum from the SWG-DRUG spectral library. A genuine standard of AM2201 was unavailable to the laboratory; a genuine standard would be required to confirm the reported result. AM2201 is federally scheduled but is not currently scheduled in the State of California.”

When there is a lack of a standard

- “At this time we are only reporting drug names, but we do not add any extra statements when we do not use a standard for reference.”

Reporting and the Analog Law

- “MDMA is substantially similar to the chemical structure of MDA. MDMA is a controlled substance analog as defined by the CA H&S code.”
 - This strategy could be taken for analogs of cathinone; some labs are doing so, some are considering it, others are limited by the local DA
- Conundrum: state legislation considers sale of material is a misdemeanor, while possession via analog law would be a felony.

Acknowledgements

- My Co-author, Celeste Trujillo, LASD
- Oakland Police Department
 - Mary Gibbons, OPD Laboratory Director
 - Waliana Dieu and Drug Analysis Unit Staff
past/present
- California Labs participating in survey
- NFLIS
- My Collaborator, Francis Woo

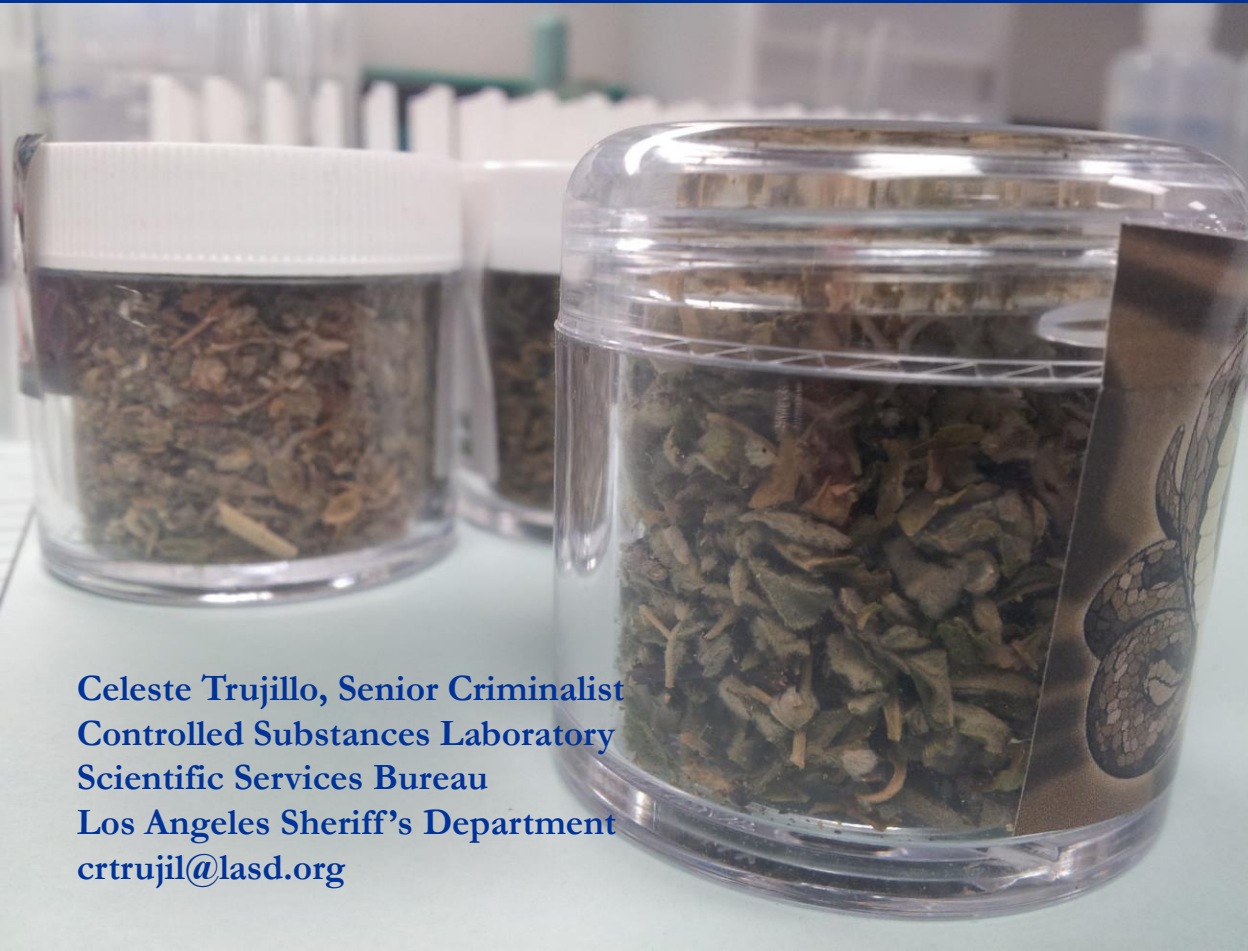
Questions?



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