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G. 知的所有権の取得状況

1. 特許取得

1) 合田幸広, 花尻瑠理, 高山廣光, 飯田満, 薮下尚智, ボアカンガアフリカーナより得られるカンナビノイド受容体薬およびその利用, 特許公開 2011-121895.

2. 実用新案登録

特になし

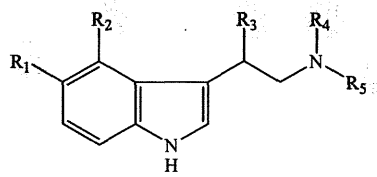
3. その他

特になし

Enforcement	Tryptamines	Phenethylamines	Cathinones	Piperazines	Synthetic cannabinoids	Others	Total
April, 2007	MIPT DPT DIPT 5-MeO-AMT 5-MeO-DMT 5-MeO-DET 5-MeO-MIPT 5-MeO-DPT 5-MeO-DALT 4-OH DIPT 4-AcO-DIPT	2C-I* 2C-T-2* 2C-T-4* 2C-C 2C-E TMA-6 PMMA 4-FMP MMDA-2 BDB HMDMA		4MPP MBZP		Isopropyl nitrite Butyl nitrite Isobutyl nitrite *t*-Butyl nitrite Isopentyl nitrite Cyclohexyl nitrite Salvinorin A Salvia divinorum	32 (29)
January, 2008		Indan-2-amine DOI	bk-MDEA (Ethylone) bk-MBDB (Butylone)	MDBP			5
January, 2009	5-MeO-EIPT	ALEPH-2 DOC *N*-Me-4-FMP	Ethcathinone MDPV				6
November, 2009			4-Methylmethcathinone	4FPP	Cannabicyclohexanol CP-47,497 JWH-018	Diphenylprolinol	6
September, 2010		DON 2C-C-3 *N*-Me-2-FMP			JWH-073 JWH-250		5
May, 2011	5-MeO-EPT	ALEPH-4	3-Fluoromethcathinone 4-Methoxymethcathinone		JWH-015 JWH-081 JWH-122 JWH-200 JWH-251		9
October, 2011			4-Fluoromethcathinone Naphyrone 4-Methylethcathinone		JWH-019 JWH-203 JWH-210 AM-694 AM-2201 RCS-4		9
Total	13	20 (17)	10	4	16	9 (including 1 Plant)	72(69)

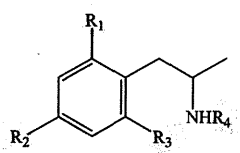
*2C-I, 2C-T-2 and 2C-T-4 were removed from "Designated Substances" because they were controlled as narcotics in 2008.

図 1 指定薬物一覧(平成 24 年 3 月現在)

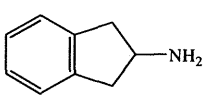


R_1	R_2	R_3	R_4	R_5	化合物名
指定薬物					
H	H	H	CH_3	$CH(CH_3)_2$	*N*-Isopropyl-*N*-methyltryptamine (MIPT)
H	H	H	$CH_2CH_2CH_3$	$CH_2CH_2CH_3$	*N,N*-Dipropyltryptamine (DPT)
H	H	H	$CH(CH_3)_2$	$CH(CH_3)_2$	*N,N*-Diisopropyltryptamine (DIPT)
OCH_3	H	CH_3	H	H	1-(5-Methoxy-1*H*-indol-3-yl)propan-2-amine (5-MeO-AMT)
OCH_3	H	H	CH_3	CH_3	5-Methoxy-*N,N*-dimethyltryptamine (5-MeO-DMT)
OCH_3	H	H	CH_2CH_3	CH_2CH_3	*N,N*-Diethyl-5-methoxytryptamine (5-MeO-DET)
OCH_3	H	H	CH_3	$CH(CH_3)_2$	*N*-Isopropyl-5-methoxy-*N*-methyltryptamine (5-MeO-MIPT)
OCH_3	H	H	CH_2CH_3	$CH_2CH_2CH_3$	*N*-Ethyl-*N*-propyl-5-methoxytryptamine (5-MeO-EPT)
OCH_3	H	H	CH_2CH_3	$CH(CH_3)_2$	*N*-Ethyl-*N*-isopropyl-5-methoxytryptamine (5-MeO-EIPT)
OCH_3	H	H	$CH_2CH_2CH_3$	$CH_2CH_2CH_3$	5-Methoxy-*N,N*-dipropyltryptamine (5-MeO-DPT)
OCH_3	H	H	$CH_2CH=CH_2$	$CH_2CH=CH_2$	*N,N*-Diallyl-5-methoxytryptamine (5-MeO-DALT)
H	OH	H	$CH(CH_3)_2$	$CH(CH_3)_2$	4-Hydroxy-*N,N*-diisopropyltryptamine (4-OH-DIPT)
H	$OCOCH_3$	H	$CH(CH_3)_2$	$CH(CH_3)_2$	4-Acetoxy-*N,N*-diisopropyltryptamine (4-AcO-DIPT)
代表的な麻薬化合物					
H	H	H	CH_3	CH_3	*N,N*-Dimethyltryptamine (DMT)
H	OH	H	CH_3	CH_3	4-Hydroxy-*N,N*-dimethyltryptamine (Psilocin)
OCH_3	H	H	$CH(CH_3)_2$	$CH(CH_3)_2$	*N,N*-Diisopropyl-5-methoxytryptamine (5-MeO-DIPT)
H	H	CH_3	H	H	3-(2-Aminopropyl)indole (AMT)

図 2-1 指定薬物構造(トリプタミン系化合物)

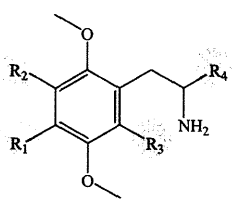


R_1	R_2	R_3	R_4	化合物名
指定薬物				
OCH_3	OCH_3	OCH_3	H	1-(2,4,6-Trimethoxyphenyl)propan-2-amine (TMA-6)
H	OCH_3	H	CH_3	1-(4-Methoxyphenyl)-*N*-methylpropan-2-amine (PMMA)
H	F	H	H	1-(4-Fluorophenyl)propan-2-amine (4FMP)
H	F	H	CH_3	*N*-Methyl-1-(4-fluorophenyl)propan-2-amine (*N*-Me-4FMP)
F	H	H	CH_3	*N*-Methyl-1-(2-fluorophenyl)propan-2-amine (*N*-Me-2FMP)
H	H	F	CH_3	1-(2-Fluorophenyl)-*N*-methylpropan-2-amine (DON)
覚せい剤				
H	H	H	H	Amphetamine
H	H	H	CH_3	Methamphetamine



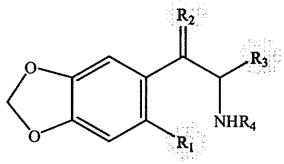
指定薬物

Indan-2-amine (2-Aminoindan)



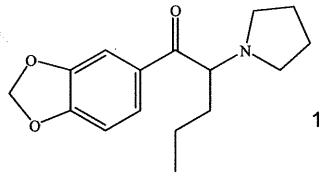
R_1	R2	R3	R4	化合物名
指定薬物				
Cl	H	H	H	2-(4-Chloro-2,5-dimethoxyphenyl)ethanamine (2C-C)
Cl	H	H	CH_3	1-(4-Chloro-2,5-dimethoxyphenyl)propan-2-amine (DOC)
Cl	Cl	Cl	H	2-(2,4,5-Trichloro-3,6-dimethoxyphenyl)ethanamine (2C-C-3)
I	H	H	H	2-(4-Iodo-2,5-dimethoxyphenyl)ethanamine (2C-I) 麻薬指定
I	H	H	CH_3	1-(4-Iodo-2,5-dimethoxyphenyl)propan-2-amine (DOI)
CH_2CH_3	H	H	H	2-(4-Ethy-2,5-dimethoxyphenyl)ethanamine (2C-E)
SCH_2CH_3	H	H	H	2-(4-Ethylsulfanyl-2,5-dimethoxyphenyl)ethanamine (2C-T-2) 麻薬指定
SCH_2CH_3	H	H	CH_3	1-(4-Ethylsulfanyl-2,5-dimethoxyphenyl)propan-2-amine (AILEPH-2)
$SCH(CH3)_2$	H	H	CH_3	1-(2,5-Dimethoxy-4-isopropylsulfanylphenyl)propan-2-amine (AILEPH-4)
$SCH(CH3)_2$	H	H	H	2-(2,5-Dimethoxy-4-isopropylsulfanylphenyl)ethanamine (2C-T-4) 麻薬指定

図 2-2 指定薬物構造(フェネチルアミン系化合物)

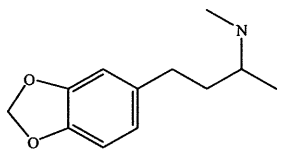


R_1	R_2	R_3	R_4	化合物名
指定薬物				
OCH_3	H_2	CH_3	H	1-(2-Methoxy-4,5-methylenedioxyphenyl)propan-2-amine (MMDA-2)
H	H_2	CH_2CH_3	H	1-(3,4-Methylenedioxyphenyl)butan-2-amine (BDB)
H	O	CH_2CH_3	CH_3	2-Methylamino-1-(3,4-methylenedioxyphenyl)butan-1-one (bk-MBDB)
H	O	CH_3	CH_2CH_3	2-Ethylamino-1-(3,4-methylenedioxyphenyl)propan-1-one (Ethylone, bk-MDEA)
代表的な麻薬化合物				
H	H_2	CH_3	CH_3	3,4-Methylenedioxymethamphetmaine (MDMA)
H	O	CH_3	CH_3	2-Methylamino-1-(3,4-methylenedioxyphenyl)propan-1-one (Methylone)

指定薬物

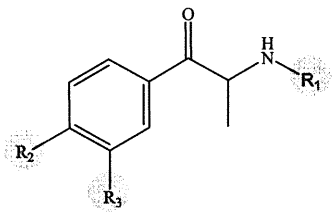


1-(3,4-Methylenedioxyphenyl)-2-(pyrrolidin-1-yl)pentan-1-one (MDPV)

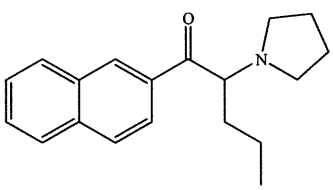


N-Methyl-4-(3,4-methylenedioxyphenyl)butan-2-amine (HMDMA)

図 2-3 指定薬物構造(フェネチルアミン系化合物(メチレンジオキシ基)及びカチノン系化合物 1)



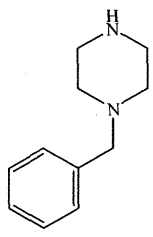
R_1	R_2	R_3	
指定薬物			
CH_3	CH_3	H	2-(Methylamino)-1-(4-methylphenyl)propan-1-one (4-Methylmethcathinone)
CH_3	OCH_3	H	1-(4-Methoxyphenyl)-2- (methylamino)propan-1-one (4-Methoxymethcathinone)
CH_3	F	H	1-(4-Fluorophenyl)-2-(methylamino)propan-1-one (4-Fluoromethcathinone)
CH_3	H	F	1-(3-Fluorophenyl)-2- (methylamino)propan-1-one (3-Fluoromethcathinone)
CH_2CH_3	H	H	2-Ethylamino-1-phenylpropan-1-one (Ethcathinone)
CH_2CH_3	CH_3	H	2-(Ethylamino)-1-(4-methylphenyl)propan-1-one (4-Methylethcathinone)

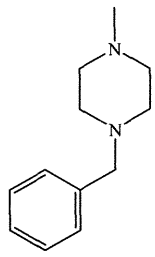


1-(Naphthalen-2-yl)-2-(pyrrolidin-1-yl)penten-1-one (Naphyrone)

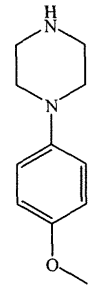
図 2-4 指定薬物構造(カチノン系化合物 2)

代表的な麻薬化合物　　指定薬物

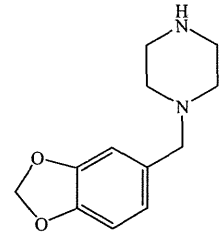




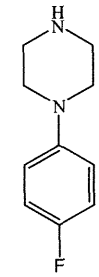
1-Benzyl-4-methylpiperazine
(MBZP)



1-(4-Methoxyphenyl)piperazine
(4MPP)

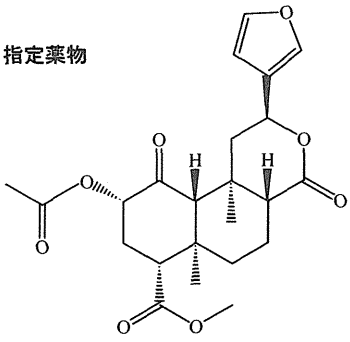


1-(3,4-Methylenedioxybenzyl)-
pperazine (MDBP)



1-(4-Fluorophenyl)-
Piperazine (4FPP)

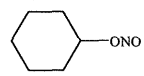
指定薬物



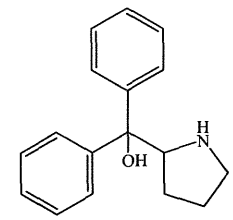
Salvinorin A

亜硝酸エステル類

$(CH_3)_2CHONO$	Isopropyl nitrite
$CH_3(CH_2)_3ONO$	Butyl nitrite
$(CH_3)_2CHCH_2ONO$	Isobutyl nitrite
$CH_3C(CH_3)_2ONO$	*tert*-Butyl nitrite
$(CH_3)_2CH(CH_2)_2ONO$	Isopentyl nitrite

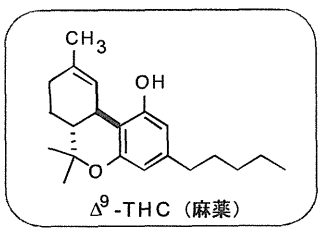


Cyclohexyl nitrite

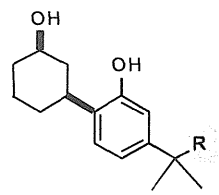


Diphenyl(pyrrolidin-2-yl)methanol
(Diphenylprolinol)

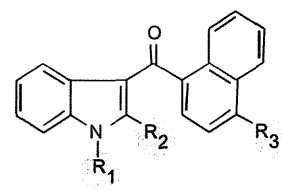
図 2-5 指定薬物構造(ピペラジン系及びその他化合物)



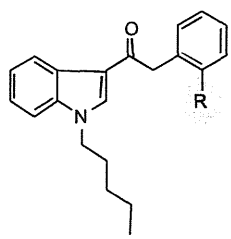
Δ^9-THC（麻薬）



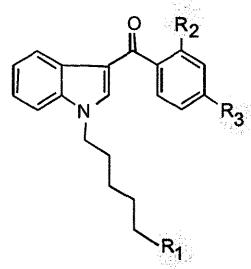
Cannabicyclohexanol (CCH) R = $(CH_2)_6CH_3$
CP-47,497 R = $(CH_2)_5CH_3$



JWH-015	$R_1 = (CH_2)_2CH_3$, $R_2 = CH_3$, $R_3 = H$
JWH-018	$R_1 = (CH_2)_4CH_3$, $R_2 = H$, $R_3 = H$
JWH-019	$R_1 = (CH_2)_5CH_3$, $R_2 = H$, $R_3 = H$
JWH-073	$R_1 = (CH_2)_3CH_3$, $R_2 = H$, $R_3 = H$
JWH-081	$R_1 = (CH_2)_4CH_3$, $R_2 = H$, $R_3 = OCH_3$
JWH-122	$R_1 = (CH_2)_4CH_3$, $R_2 = H$, $R_3 = CH_3$
JWH-200	R_1 = 2-(4-morpholino)ethyl, $R_2 = H$, $R_3 = H$
JWH-210	$R_1 = (CH_2)_4CH_3$, $R_2 = H$, $R_3 = CH_2CH_3$
AM-2201	$R_1 = (CH_2)_4CH_2F$, $R_2 = H$, $R_3 = H$

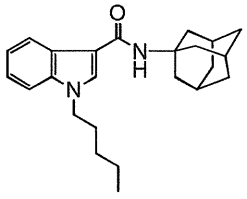


JWH-203 R = Cl
JWH-250 R = OCH_3
JWH-251 R = CH_3



AM-694 R_1 = F, R_2 = I, R_3 = H
RCS-4 R_1 = H, R_2 = H, R_3 = OCH_3

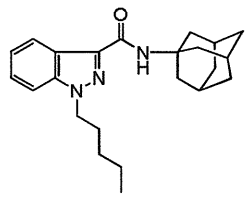
図 2-5 指定薬物構造(合成カンナビノイド類)



1

N-(1-adamantyl)-1-pentyl-1*H*-indole-3-carboxamide (APICA)

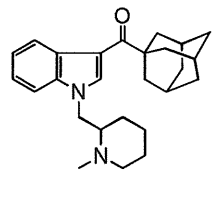
$C_{24}H_{32}N_2O$: 364



2

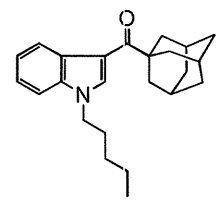
N-(1-adamantyl)-1-pentyl-1*H*-indazole-3-carboxamide (APINACA)

$C_{23}H_{31}N_3O$: 365



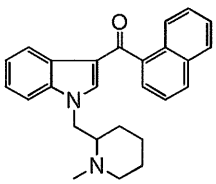
AM-1248

$C_{26}H_{34}N_2O$: 390



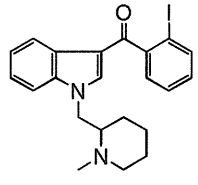
1-Adamanty-1-pentyl-1*H*-indol-3-yl ketone (AB-001)

$C_{24}H_{31}NO$: 349



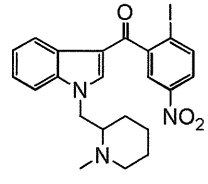
AM-1220

$C_{26}H_{26}N_2O$: 382



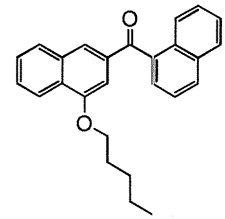
AM-2233

$C_{22}H_{23}IN_2O$: 458



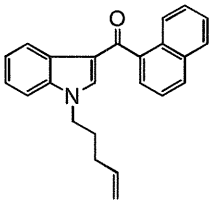
AM-1241

$C_{22}H_{22}IN_3O_3$: 503



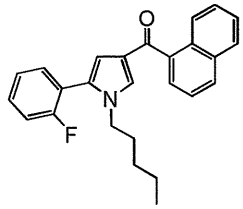
CB-13 (CRA-13)

$C_{26}H_{24}O_2$: 368



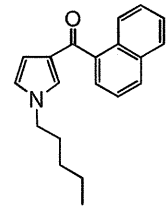
JWH-022

$C_{24}H_{21}NO$: 339



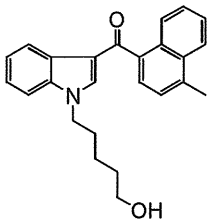
JWH-307

$C_{26}H_{24}FNO$: 385



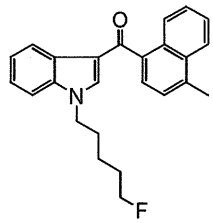
JWH-030

$C_{20}H_{21}NO$: 291



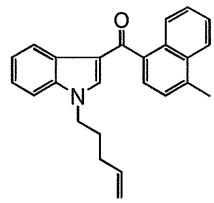
N-(5-hydroxypentyl)-JWH-122

$C_{25}H_{25}NO_2$: 371



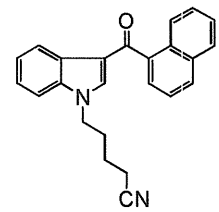
(4-methylnaphthyl)-AM-2201 (MAM-2201)

$C_{25}H_{24}FNO$: 373



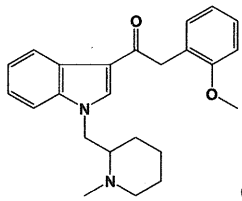
(4-methylnaphthyl)-JWH-022

$C_{25}H_{23}NO$: 353



AM-2232

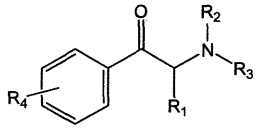
$C_{24}H_{20}N_2O$: 352



cannabipiperidiethanone $C_{24}H_{28}N_2O_2$: 376

図 3 平成 23 年度試買製品より検出された未規制の新規流通違法ドラッグ成分（推定化合物を含む）及び平成 22 年度試買製品より検出された新規流通違法ドラッグ成分カンナビピペリジエタノン

＊上記化合物のうち，APICA, APINACA, AM-1220, AM-2233, CB-13, JWH-022 及びカンナビピペリジエタノンが新規指定薬物指定化合物案として平成 24 年 4 月 20 日よりパブリックコメントで公表



Common name	R_1	R_2	R_3	R_4	Regulation category in Japan (as of March, 2012)
[Cathinone]	CH_3	H	H	H	Narcotic
[Methcathinone (Ephedrone)]	CH_3	CH_3	H	H	Narcotic
3,4-Dimethylmethcathinone	CH_3	CH_3	H	3,4-dimethyl	
Ethcathinone	CH_3	CH_2CH_3	H	H	Designated substance
[Amfepramone (Diethylpropion)]	CH_3	CH_2CH_3	CH_2CH_3	H	Psychotropic
4-Methylmethcathinone (Mephedrone)	CH_3	CH_3	H	4-CH_3	Designated substance
4-Methylethcathinone	CH_3	CH_2CH_3	H	4-CH_3	Designated substance
4-Fluoromethcathinone (Flephedrone)	CH_3	CH_3	H	4-F	Designated substance
3-Fluoromethcathinone	CH_3	CH_3	H	3-F	Designated substance
4-Methoxymethcathinone (Methedrone)	CH_3	CH_3	H	4-OCH_3	Designated substance
4-Methoxy-*N*,*N*-dimethylcathinone	CH_3	CH_3	CH_3	4-OCH_3	
Buphedrone	CH_2CH_3	CH_3	H	H	
4-Methylbuphedrone	CH_2CH_3	CH_3	H	4-CH_3	
4-Methyl-*N*-methylbuphedrone	CH_2CH_3	CH_3	CH_3	4-CH_3	
N-Ethylbuphedrone (NEB)	CH_2CH_3	CH_2CH_3	H	H	
Pentedrone	$CH_2CH_2CH_3$	CH_3	H	H	
Methylone (bk-MDMA)	CH_3	CH_3	H	3,4-methylenedioxy	Narcotic
Ethylone (bk-MDEA)	CH_3	CH_2CH_3	H	3,4-methylenedioxy	Designated substance
bk-MDBZ	CH_3	benzyl	H	3,4-methylenedioxy	
Butylone (bk-MBDB)	CH_2CH_3	CH_3	H	3,4-methylenedioxy	Designated substance
Pentylone	$CH_2CH_2CH_3$	CH_3	H	3,4-methylenedioxy	
alpha-PBP	CH_2CH_3	pyrrolidinyl		H	
alpha-PVP	$CH_2CH_2CH_3$	pyrrolidinyl		H	
MPPP	CH_3	pyrrolidinyl		4-CH_3	
Pyrovalerone	$CH_2CH_2CH_3$	pyrrolidinyl		4-CH_3	Psychotropic
MDPBP	CH_2CH_3	pyrrolidinyl		3,4-methylenedioxy	
MDPV (3,4-Methylenedioxypyrovalerone)	$CH_2CH_2CH_3$	pyrrolidinyl		3,4-methylenedioxy	Designated substance
Naphyrone (Naphthylpyrovalerone)	$CH_2CH_2CH_3$	pyrrolidinyl		(naphthyl structure)	Designated substance

図 4 カチノン誘導体構造(規制化合物及び国内において流通が認められている未規制化合物)

＊上記化合物のうち，3,4-ジメチルメトカチノンが新規指定薬物指定化合物案として平成 24 年 4 月 20 日よりパブリックコメントで公表

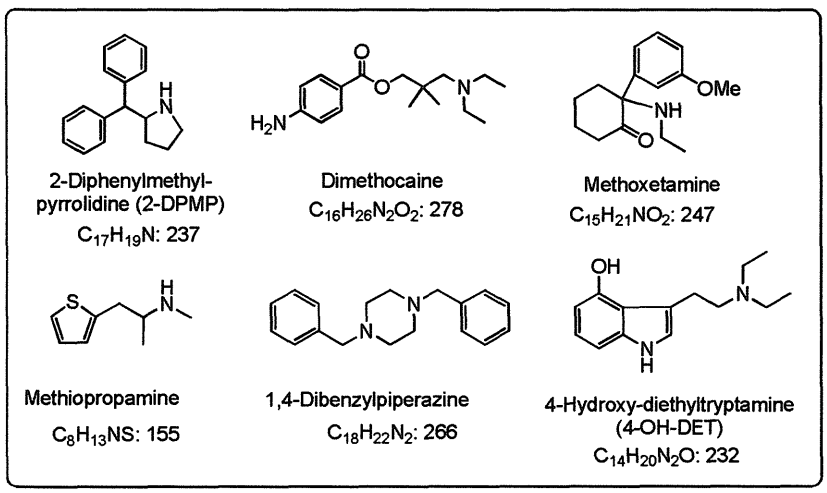


図 5 国内において流通が認められている未規制化合物(合成カンナビノイド及びカチノン誘導体以外)

＊上記化合物のうち，メトキセタミンが新規指定薬物指定化合物案として平成 24 年 4 月 20 日よりパブリックコメントで公表

別添 2

指定薬物の GC-MS 及び LC-PDA-MS スペクトルデータ

①平成 19 年 4 月 1 日施行指定薬物 22 化合物の GC-MS 及び LC-PDA-MS のスペクトル
(その後麻薬に指定された 2C-I, 2C-T-2, 2C-T-4 及び亜硝酸エステル類を除く)

分析条件

GC-MS 条件

装置:Agilent 社製 6890N GC 及び 5975 MSD

カラム:HP-1MS(30 m x 0.25 mm i.d., 膜厚 0.25 μm, Agilent 社製)

キャリアーガス:He, 0.7 mL/min

注入口温度:200℃, スプリットレス, 検出器温度:280℃, イオン化法:EI 法

カラム温度:80℃(1 min hold)－5℃/min－190℃(15 min hold)－10℃/min－310℃(10 min hold))

HPLC-PDA 及び LC-MS 条件

装置: Agilent 社製 1100 シリーズ LC/MSD

カラム:Atlantis T3(2.1 x 150 mm, 5 μm, Waters 社製)

移動相 A:10 mM ギ酸アンモニウム緩衝(pH 3), 移動層 B:アセトニトリル

A:B 90:10(0 min)－80:20(50 min)－30:70(60 min, 10 min hold)

流速:0.3 mL/min, カラム温度:40 ℃

注入量:1 μL

検出:ダイオードアレイ検出器(モニタリング波長 UV 210 nm)及び質量検出器

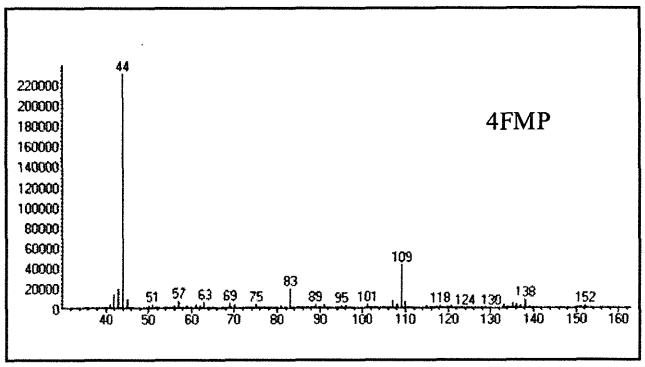
質量分析条件

イオン化 : ESI 法, ポジティブモード, Fragmentor : 100 V, Gas temp. : 330 ℃

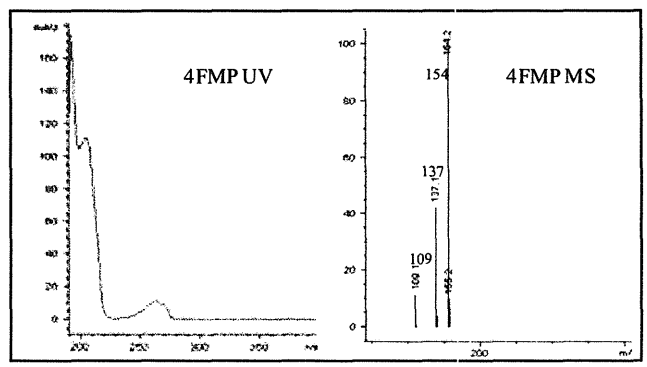
Drying gas : N_2 13.0 L/min, Vcap : 3500 V

1) 4FMP

GC-MS

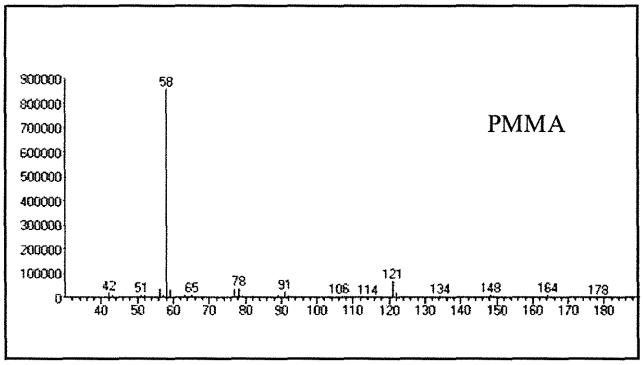


LC-PDA-MS

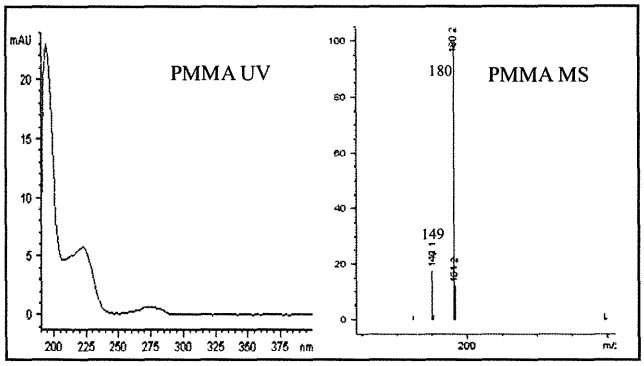


2) PMMA

GC-MS

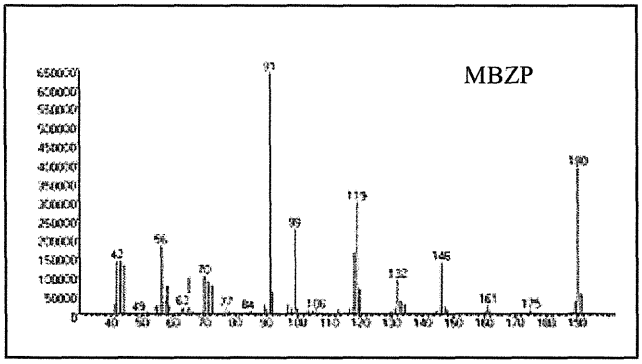


LC-PDA-MS

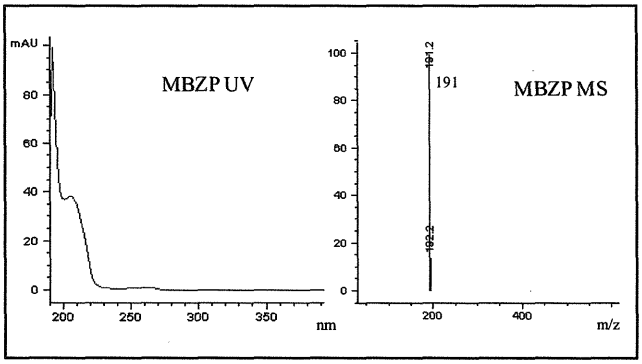


3) MBZP

GC-MS

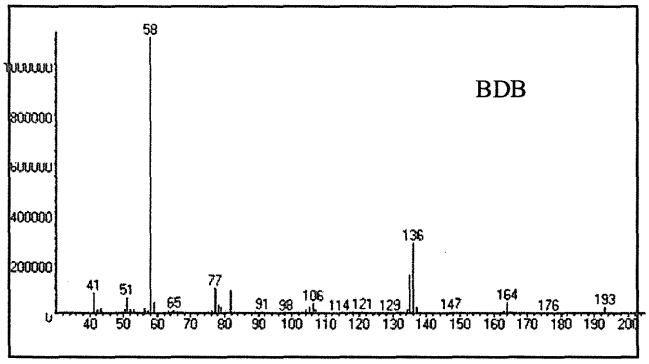


LC-PDA-MS

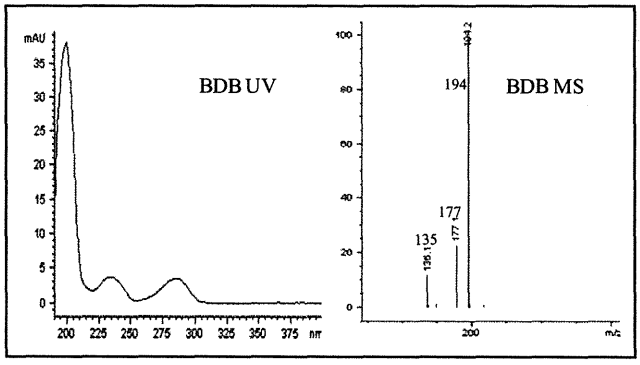


4) BDB

GC-MS

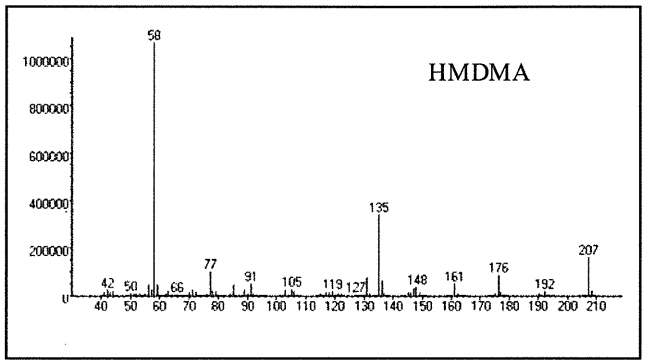


LC-PDA-MS

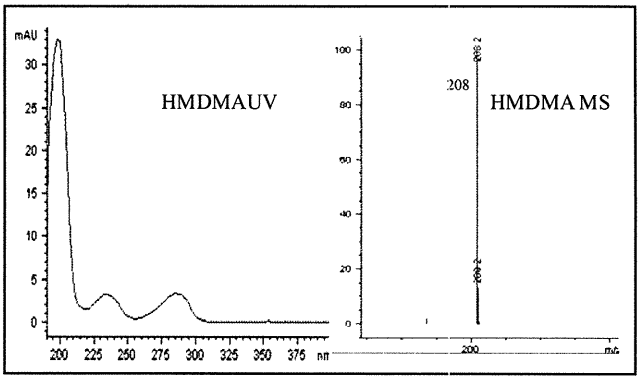


5) HMDMA

GC-MS

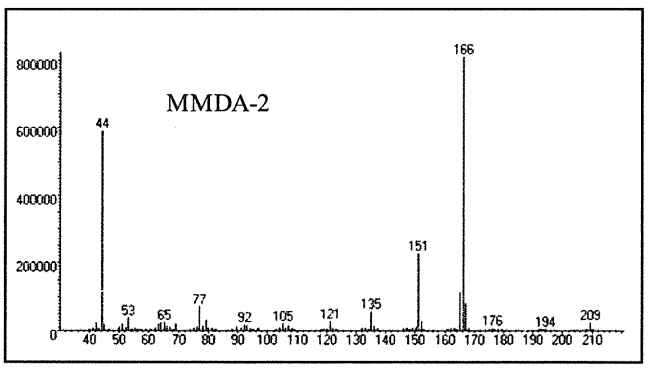


LC-PDA-MS

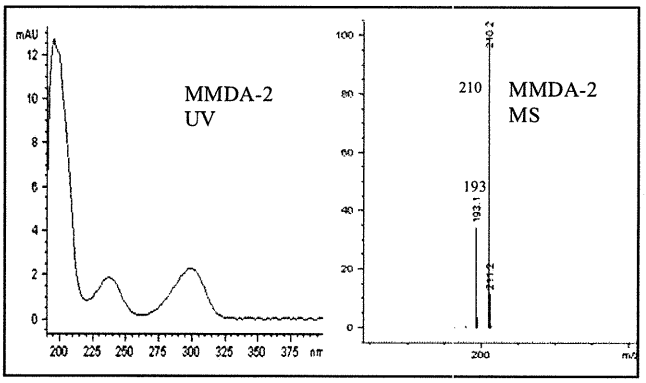


6) MMDA-2

GC-MS

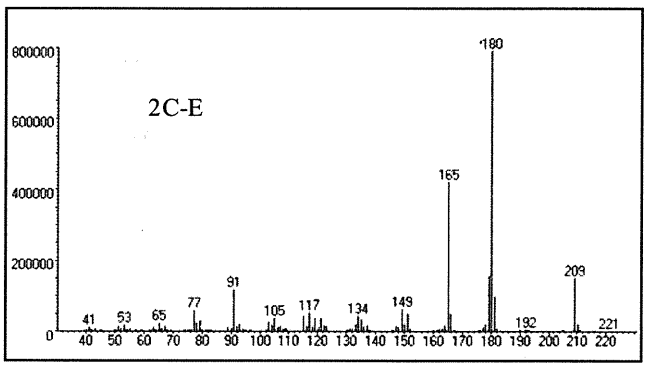


LC-PDA-MS

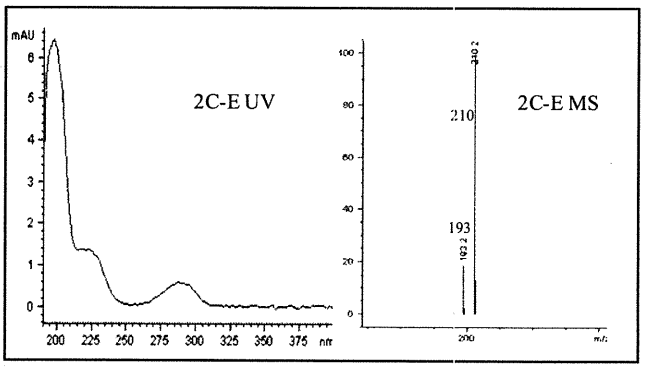


7) 2C-E

GC-MS

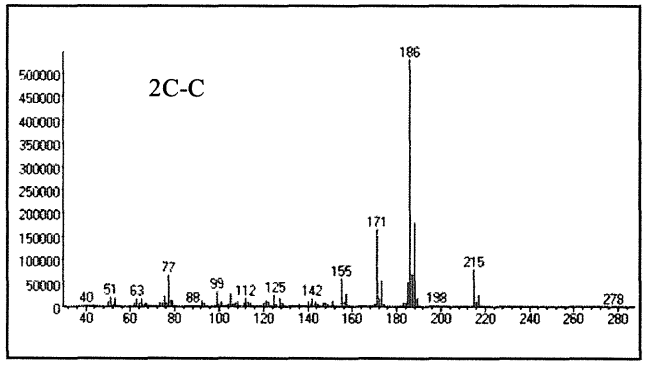


LC-PDA-MS

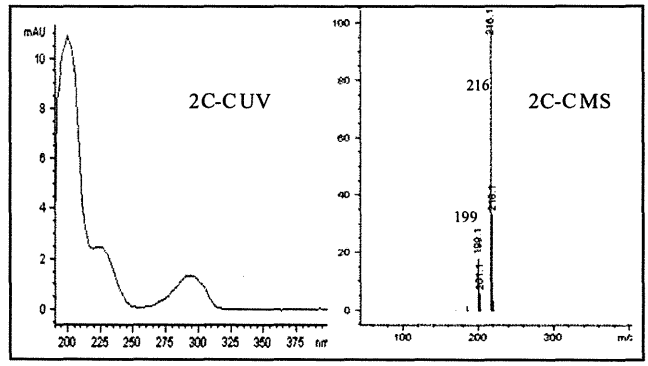


8) 2C-C

GC-MS

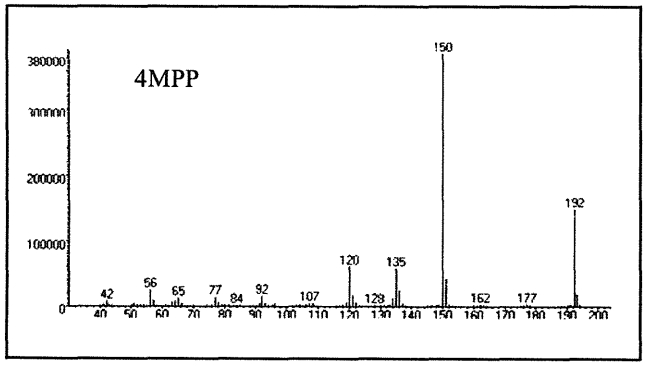


LC-PDA-MS

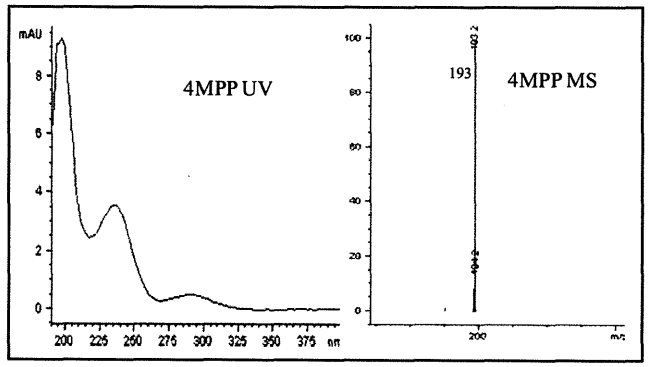


9) 4MPP

GC-MS

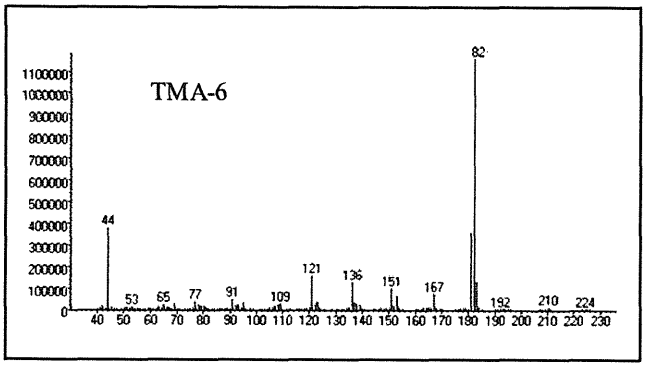


LC-PDA-MS

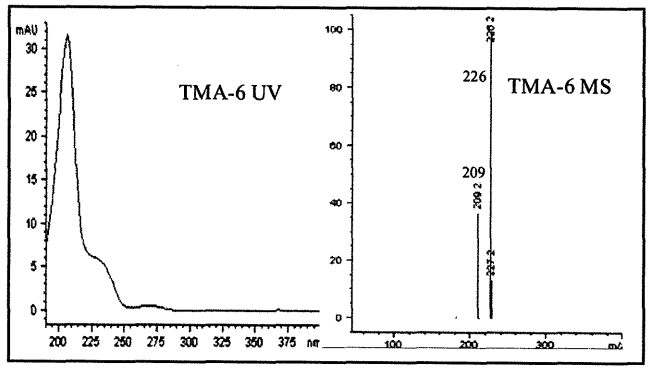


10) TMA-6

GC-MS

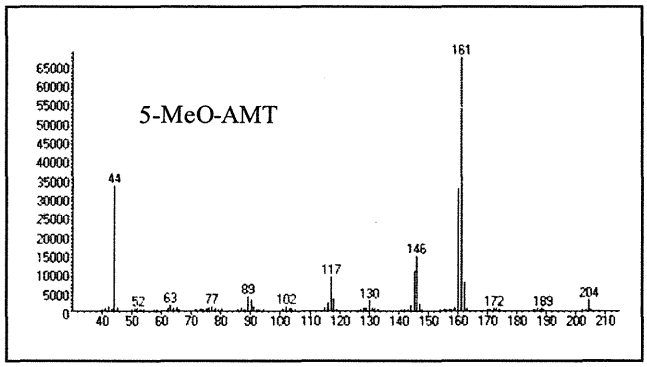


LC-PDA-MS

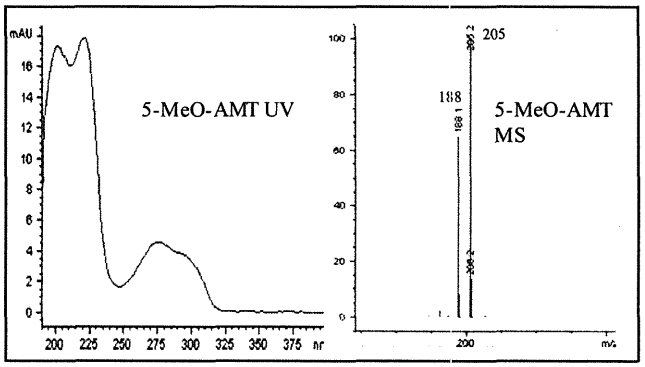


11) 5-MeO-AMT

GC-MS

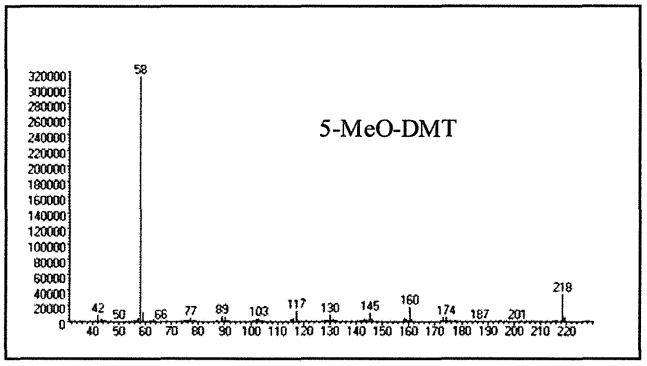


LC-PDA-MS

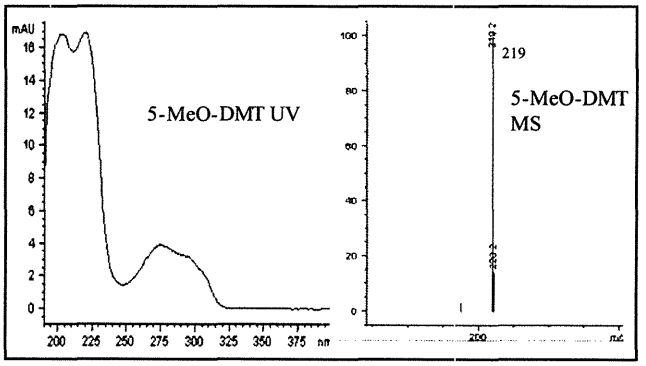


12) 5-MeO-DMT

GC-MS

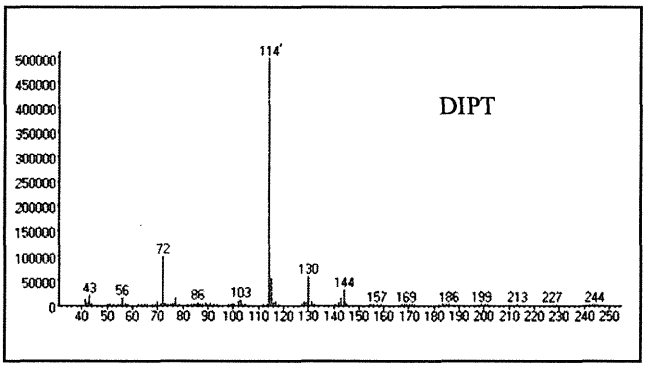


LC-PDA-MS

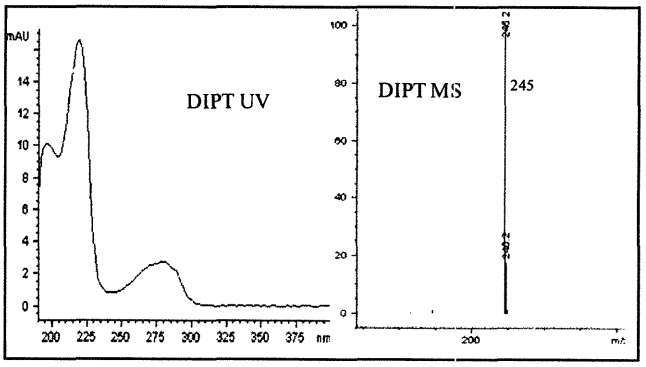


13) DIPT

GC-MS

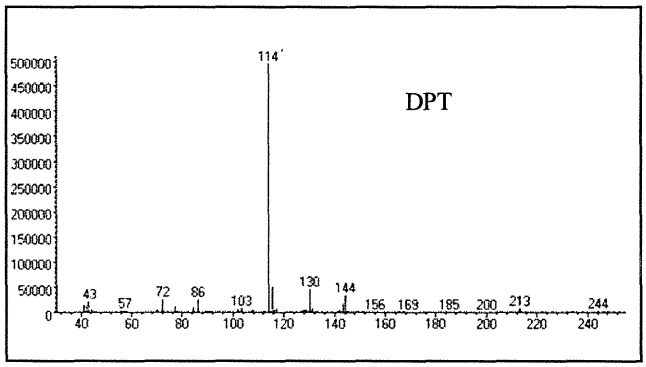


LC-PDA-MS

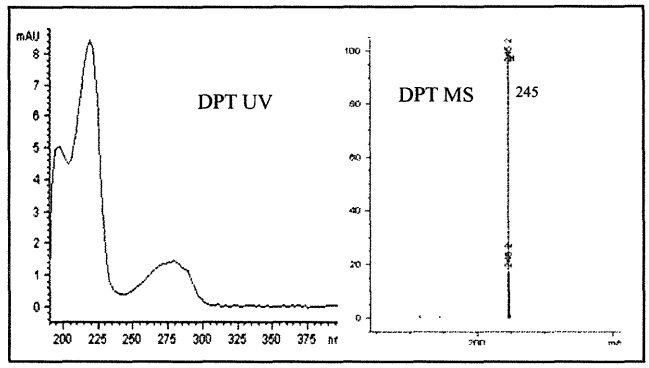


14) DPT

GC-MS

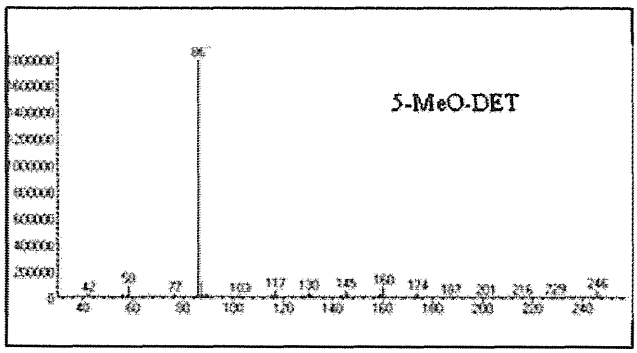


LC-PDA-MS

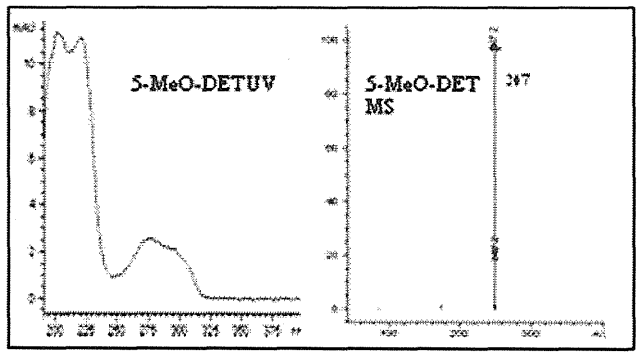


15) 5-MeO-DET

GC-MS

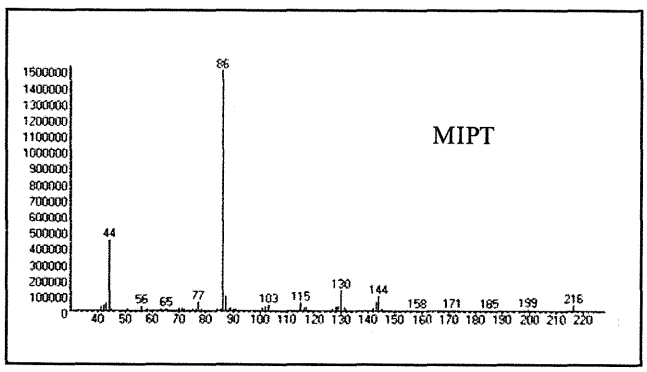


LC-PDA-MS

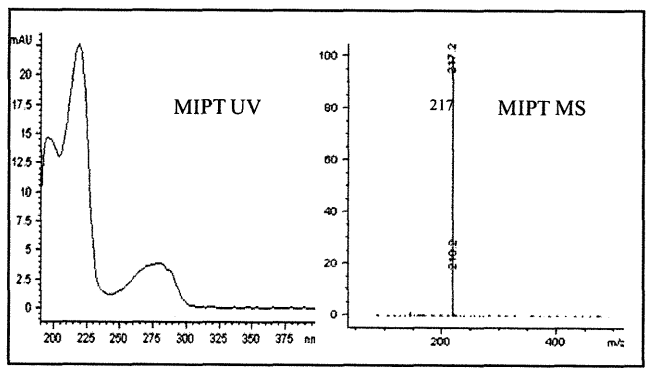


16) MIPT

GC-MS

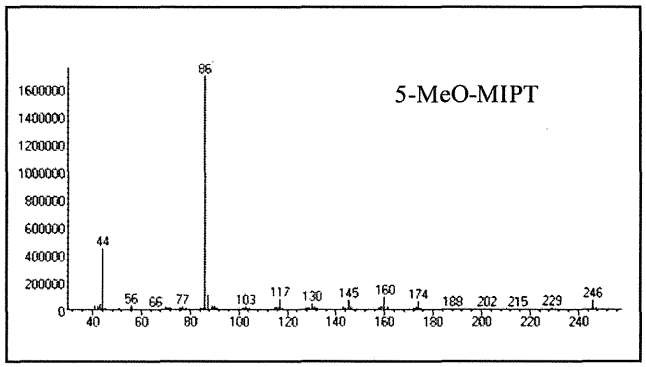


LC-PDA-MS

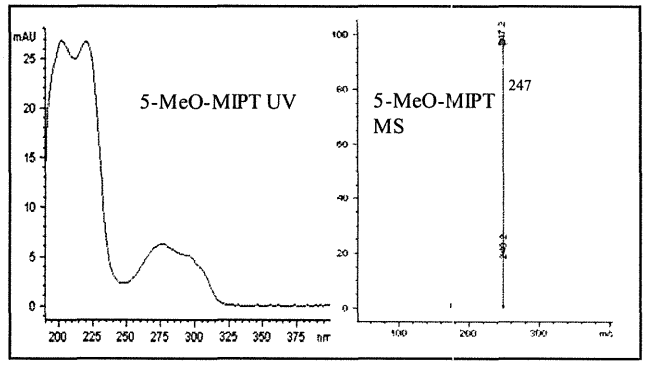


17) 5-MeO-MIPT

GC-MS

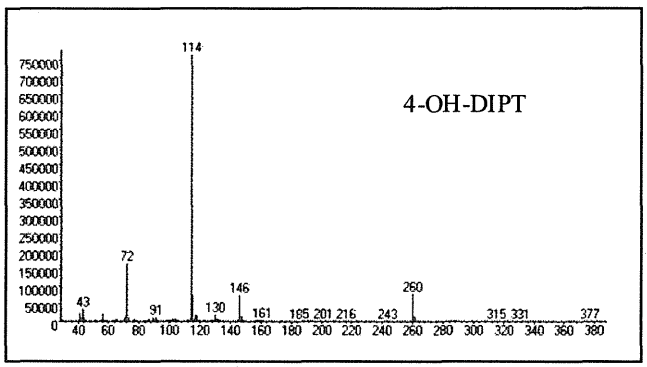


LC-PDA-MS

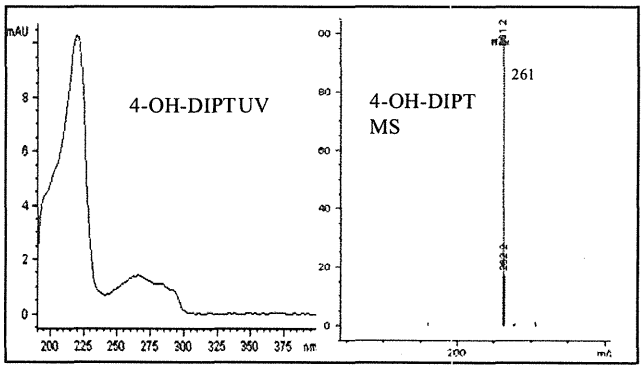


18) 4-OH-DIPT

GC-MS

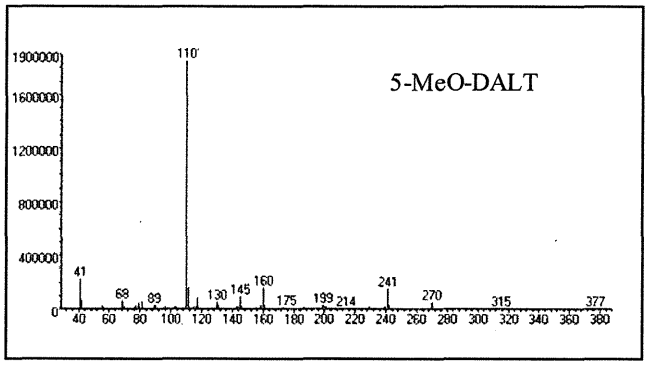


LC-PDA-MS

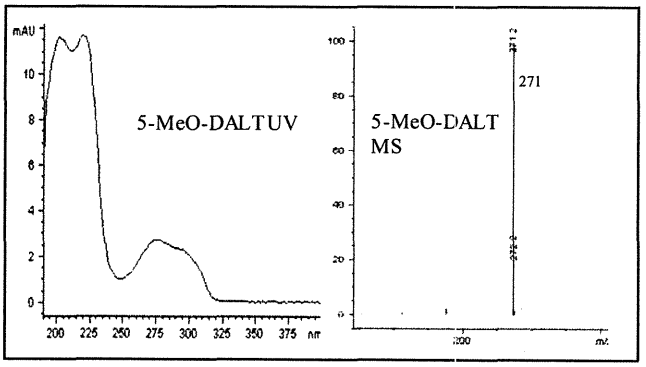


19) 5-MeO-DALT

GC-MS

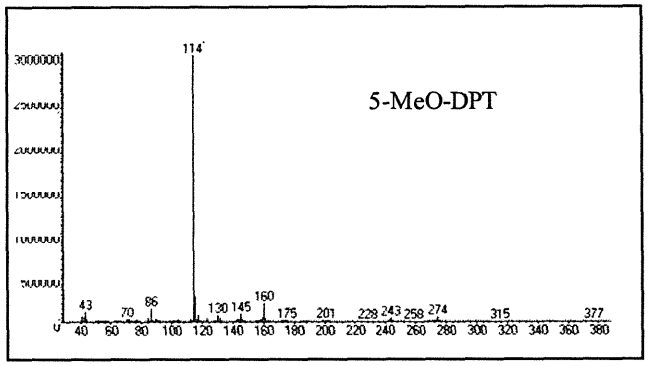


LC-PDA-MS

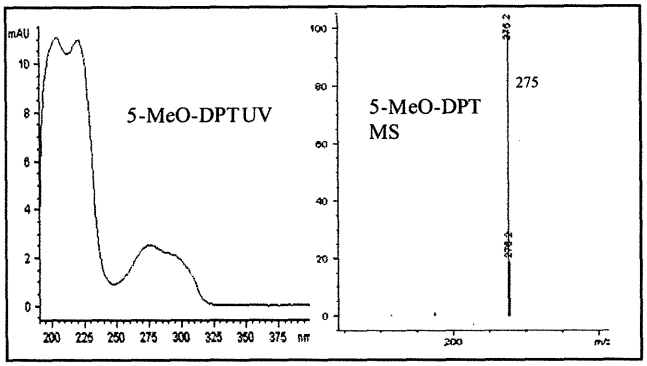


20) 5-MeO-DPT

GC-MS

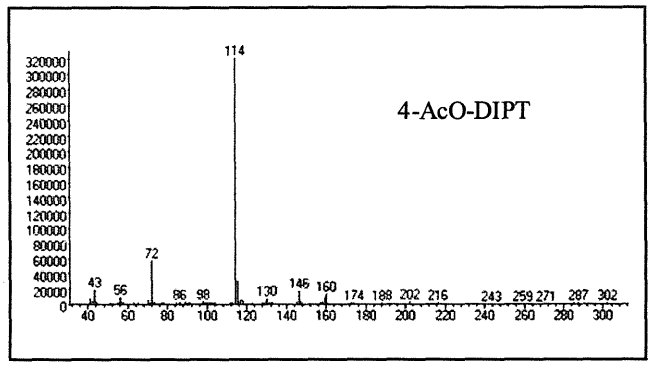


LC-PDA-MS

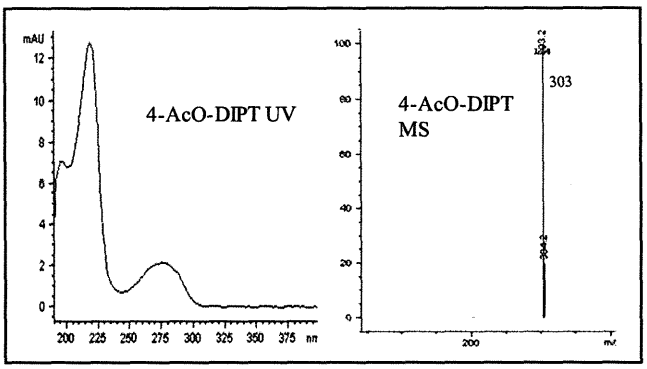


21) 4-AcO-DIPT

GC-MS

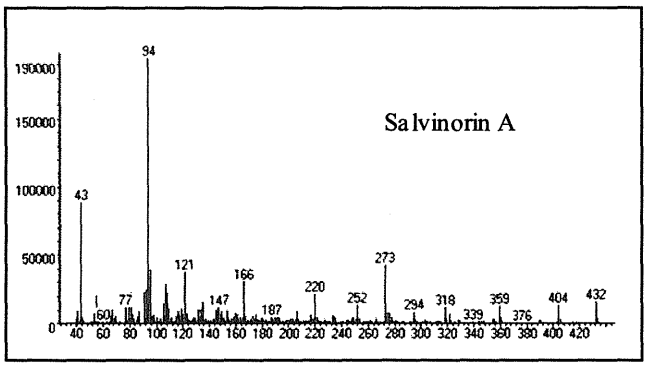


LC-PDA-MS

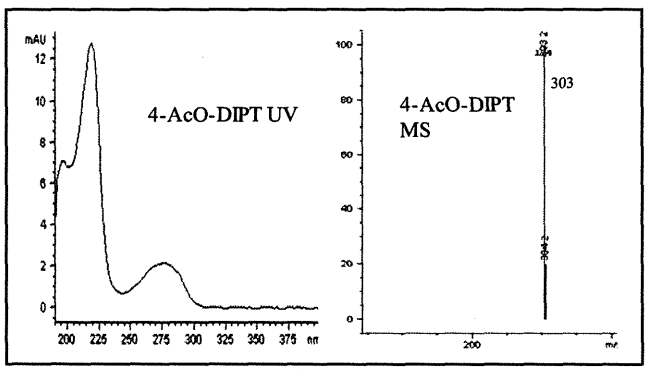


22) Salvinorin A

GC-MS



LC-PDA-MS

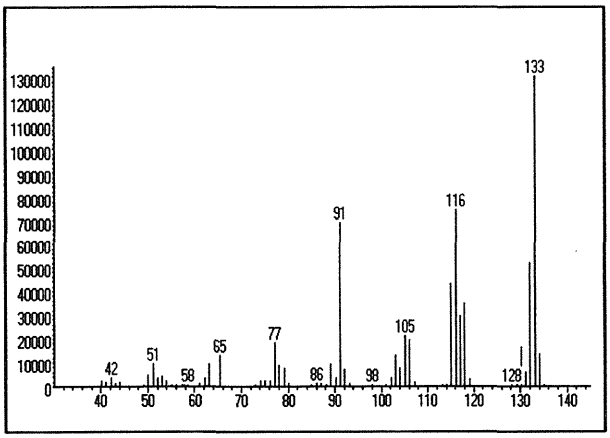


②平成 20 年 1 月 11 日施行指定薬物 5 化合物の GC-MS 及び LC-PDA-MS のスペクトル

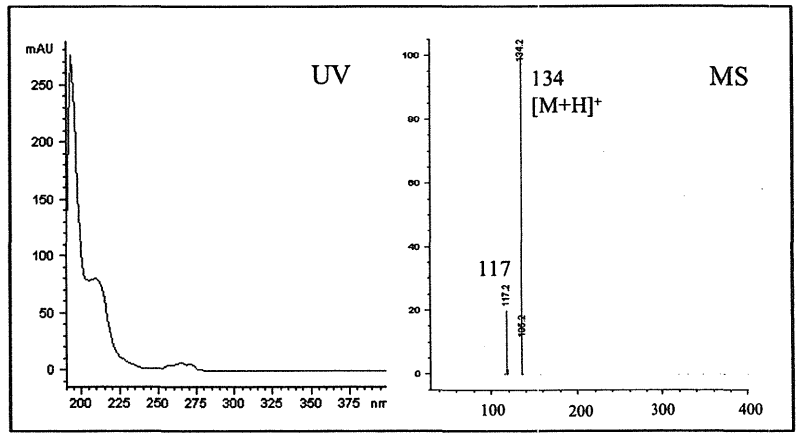
*分析法は①に準ずる.

1) Indan-2-amine

GC-MS

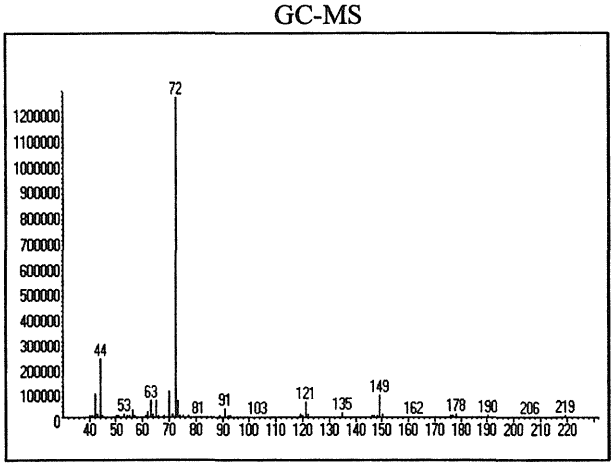


LC-MS

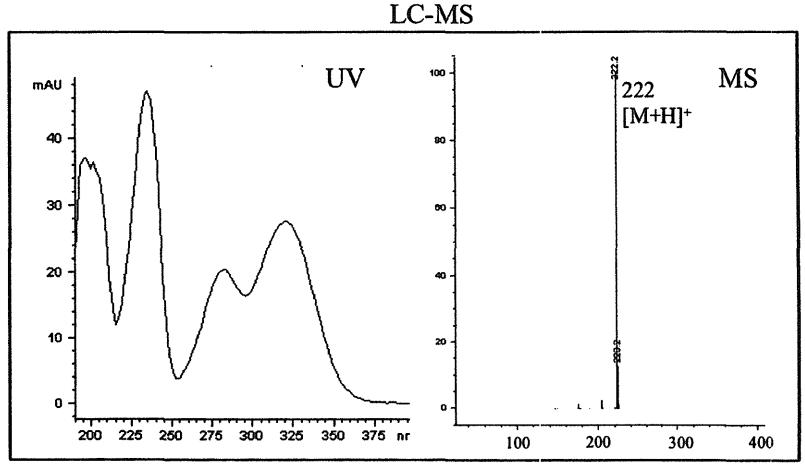


2) bk-MDEA

GC-MS

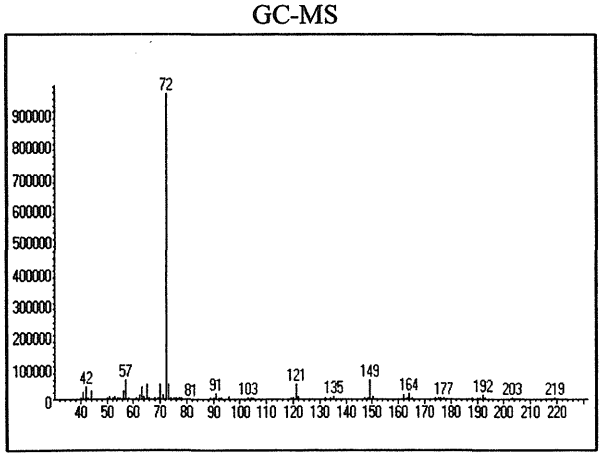


LC-MS

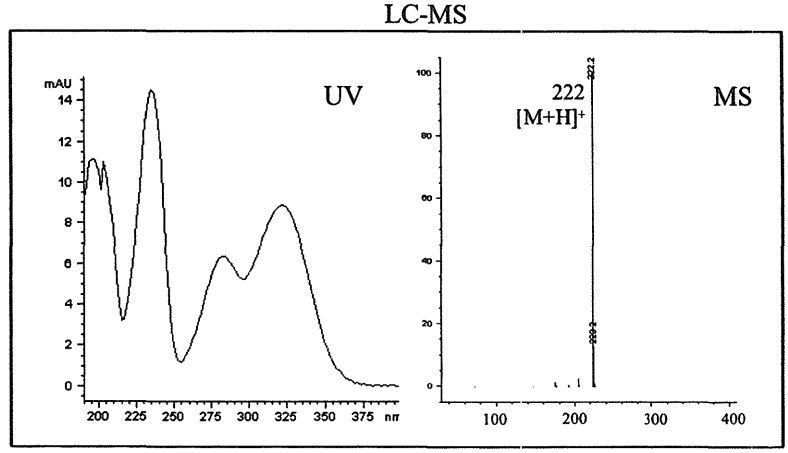


3) bk-MBDB

GC-MS

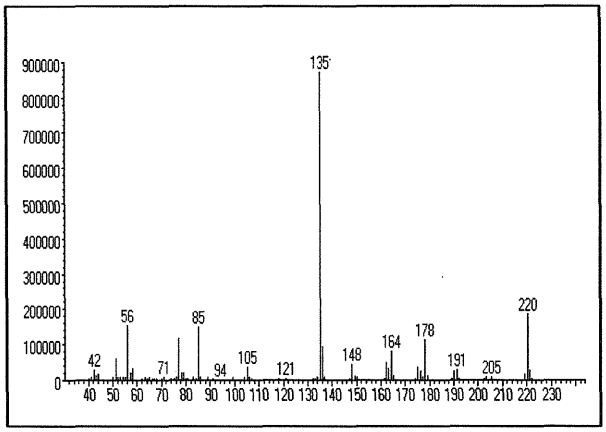


LC-MS

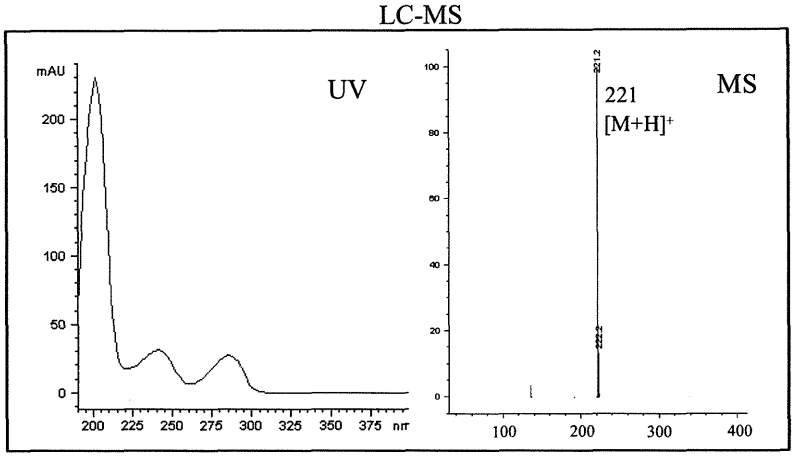


4) MDBP

GC-MS

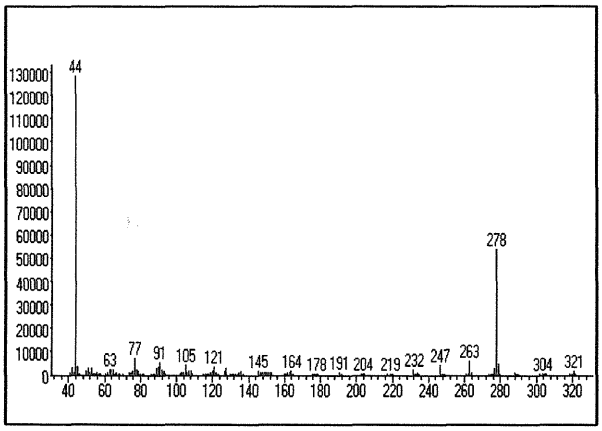


LC-MS

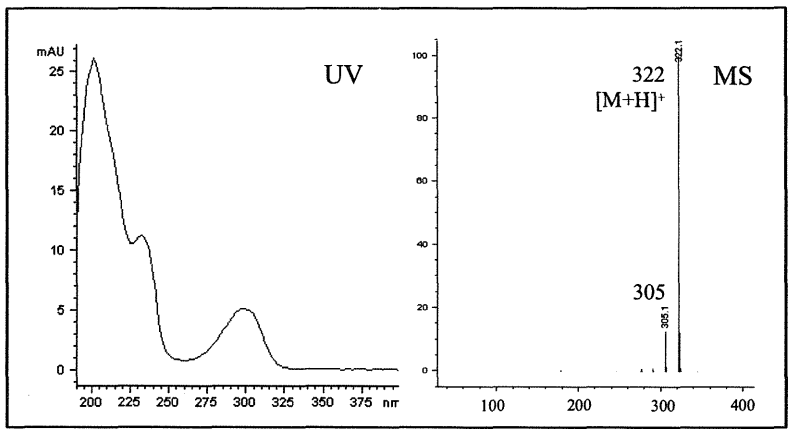


5) DOI

GC-MS



LC-MS

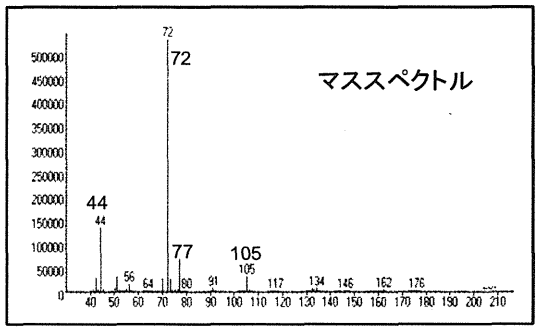


③平成 21 年 1 月 16 日施行指定薬物 6 化合物の GC-MS 及び LC-PDA-MS のスペクトル

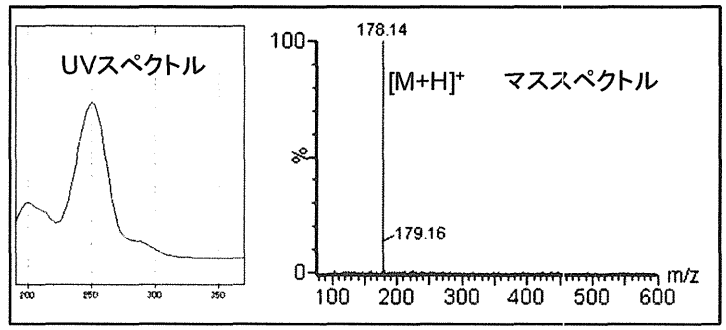
*分析法は①に準ずる.

1) エトカチノン

GC-MS

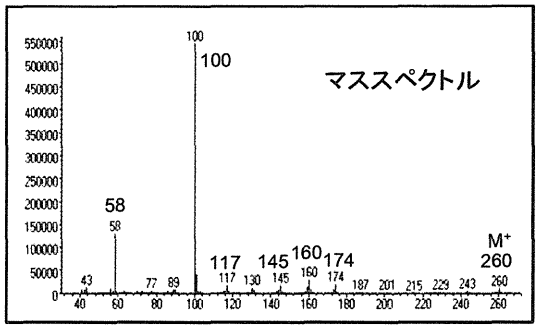


LC-PDA-MS

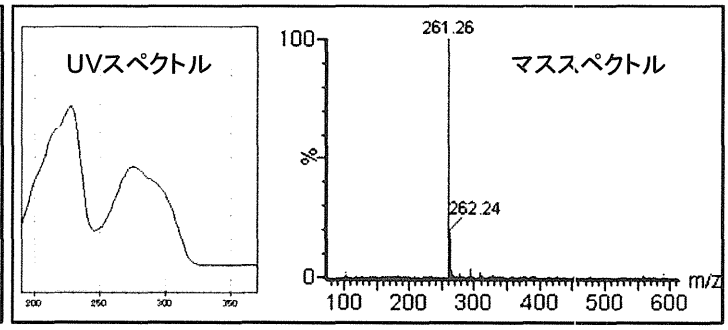


2) 5-MeO-EIPT

GC-MS

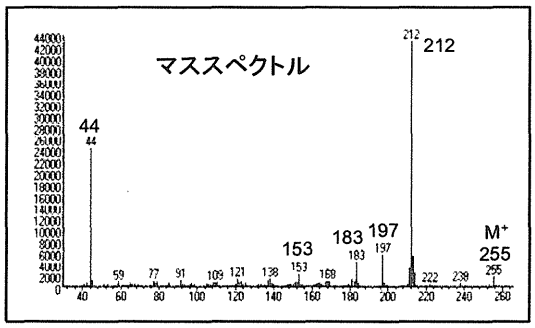


LC-PDA-MS

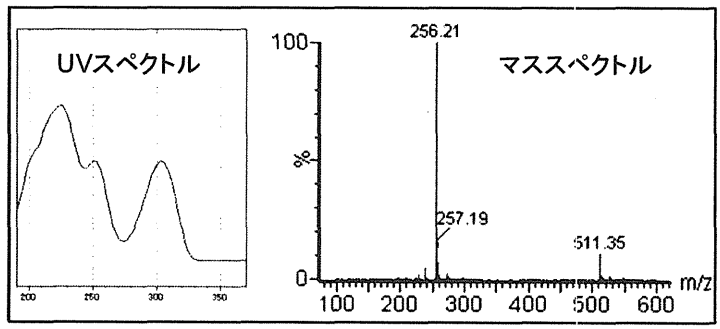


3) ALEPH-2

GC-MS

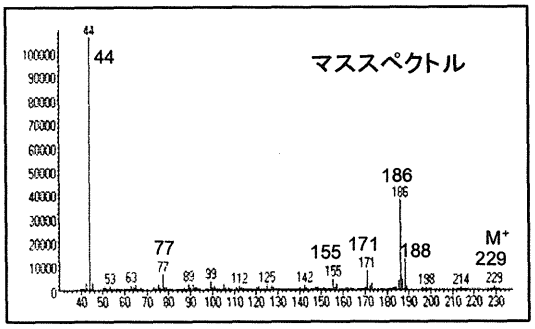


LC-PDA-MS

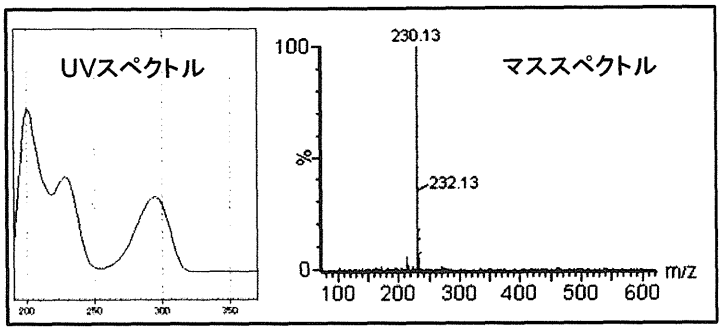


4) DOC

GC-MS

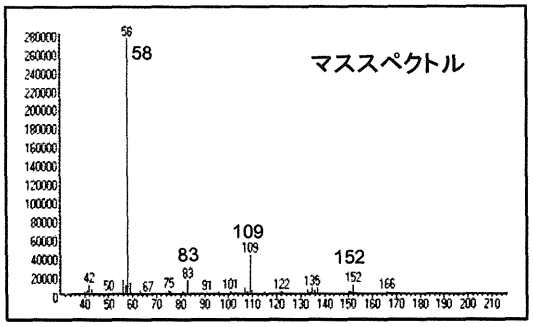


LC-PDA-MS

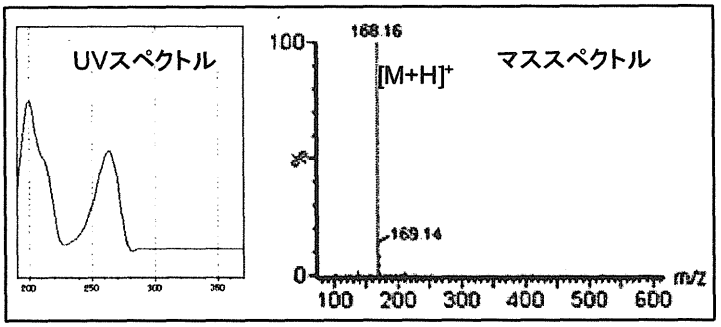


5) *N*-メチル-4-FMP

GC-MS

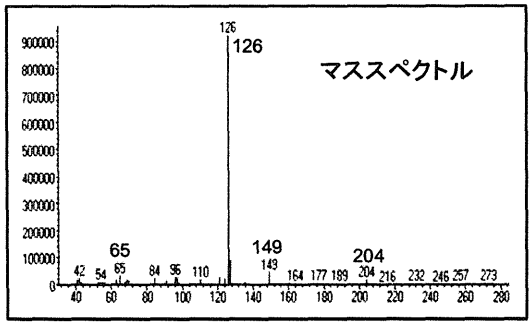


LC-PDA-MS



6) MDPV

GC-MS



LC-PDA-MS