

(19) (KR)
(12) (A)

(51) Int. Cl.⁷
C07D 493/22

(11)
(43)

10-2004-0007455
2004 01 24

(21) 10-2003-7011231

(22) 2003 08 26

2003 08 26

(86) PCT/EP2002/002043

(87)

WO 2002/68441

(86) 2002 02 26

(87)

2002 09 06

(30) 374/01

2001 02 27

(CH)

(71) 4058

215

(72) -4058

215

-4058

215

-4058

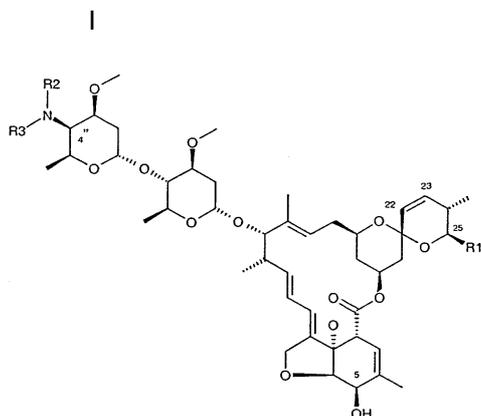
215

(74)

:

(54) , 4 가

, | , ; , E/Z , E/Z / ; ; ; 가 ; ; ;



R_1 C₁-C₁₂, C₃-C₈ C₂-C₁₂ ;

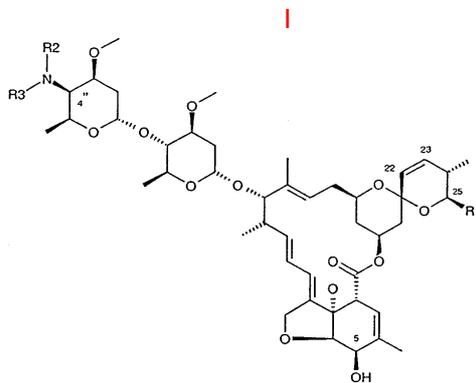
R_2 H, C₂-C₁₂ ; C₁-C₁₂ ,

R_3 C₂-C₁₂, C₁-C₁₂, C₃-C₁₂, C₂-C₁₂ C₁-C₆, C₂-C₁₂ ;

R_2 R_3 ;
 , R_2 가 H R_3 2- , n- , R_1 2

, 4' 가 , E/Z , , , ,

I , E/Z , E/Z / ; , ; ; :



I ,

R_1 C₁-C₁₂, C₃-C₈ C₂-C₁₂ ;

R_2 H, C₂-C₁₂ ; C₁-C₁₂ ,

R_3 C₂-C₁₂, C₁-C₁₂, C₃-C₁₂, C₂-C₁₂ C₁-C₆, C₂-C₁₂ ;

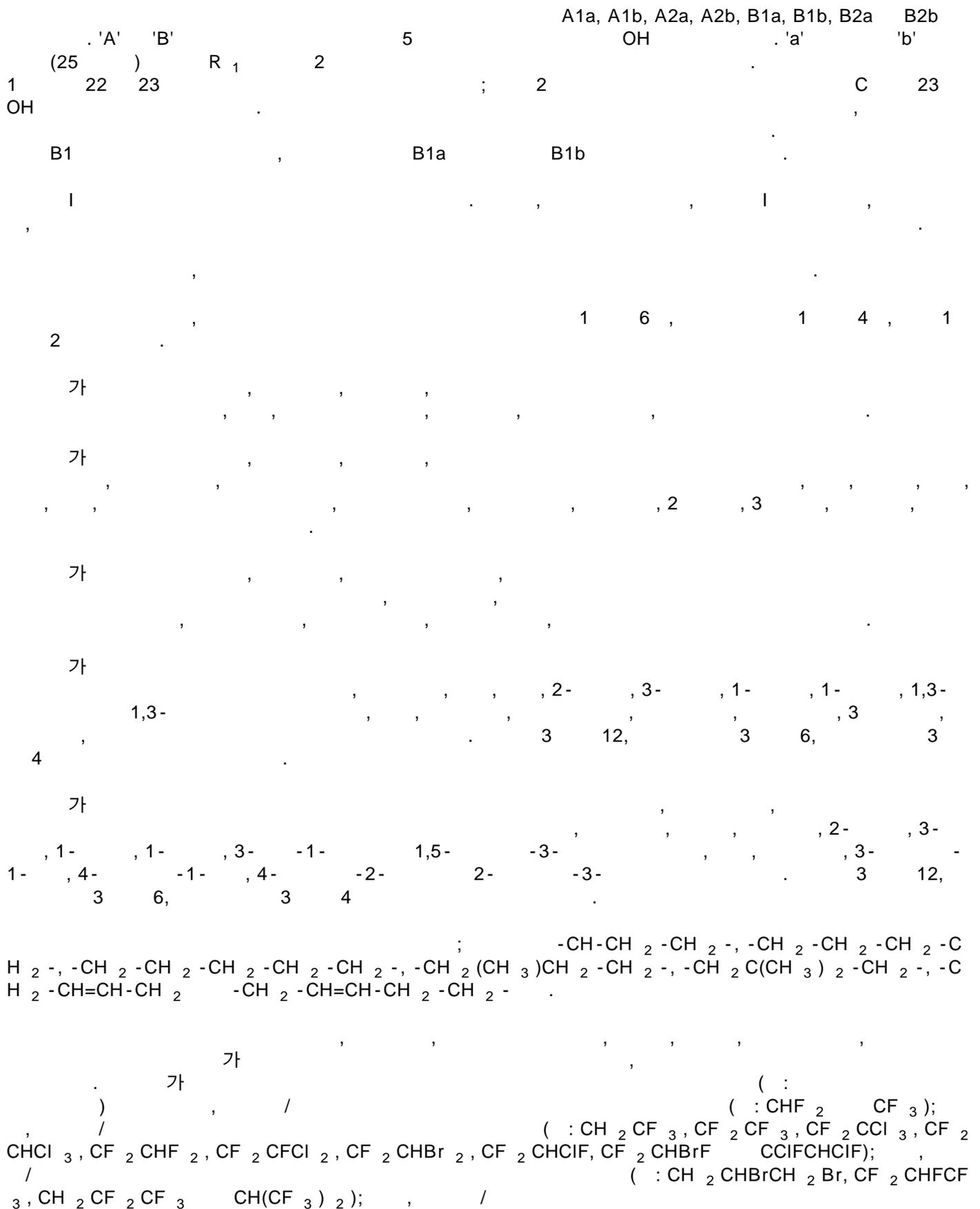
R_2 R_3 CH₂, O, S NR₄ 3 7 4 7

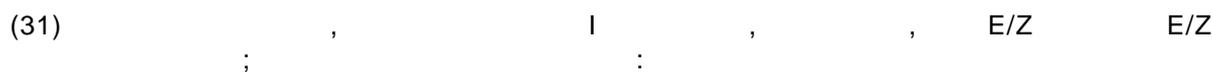
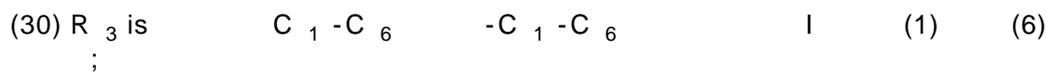
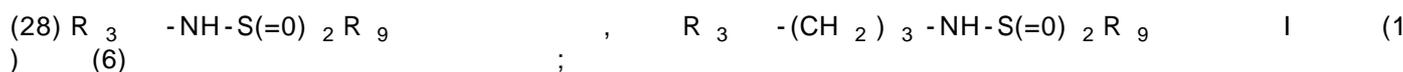
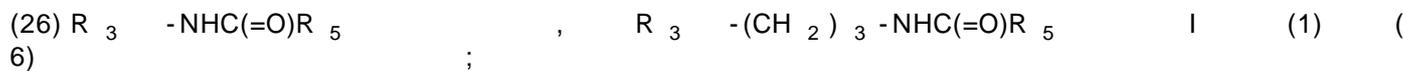
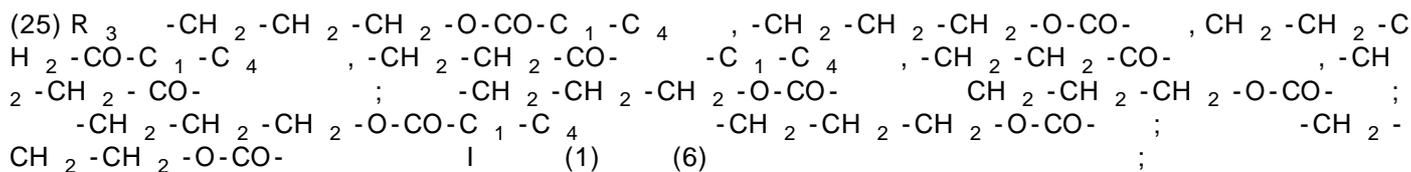
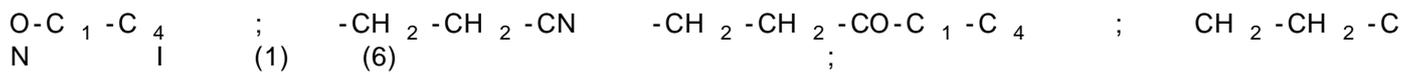
-C₁-C₂, CN, SCN, NO₂, C₂-C₆ OH, ,
 C₃-C₈ - ; 1 3 1 3 C₃-

가

가

(Streptomyces avermitilis)





- 4'- -4'- -N- B1;
- 4'- -4'- -N- -1- B1;
- 4'- -4'- -(N- -N-) B1;
- 4'- -4'- -(N- -N- -1-) B1;
- 4'- -4'- -(N- -N-) B1;
- 4'- -4'- -(N- -N-1- -3-) B1;
- 4'- -4'- -(N- -N-) B1;
- 4'- -4'- -(N- -N-) B1;
- 4'- -4'- -(N- -N-4-) B1;
- 4'- -4'- -(N- -N-2,5-) B1;
- 4'- -4'- -(N- -N-2,5-) B1;
- 4'- -4'- -(N- -N-2,3,4-) B1;
- 4'- -4'- -(-1-) B1;
- 4'- -4'- -(-1-) B1;
- 4'- -4'- -[N-(2- -2- -)-N-]- B1;
- 4'- -4'- -[N-(3- -)-N-]- B1;

4'- -4'- -N-(2- -)- B1;

4'- -4'- -N-[(6- -3-)-]- B1;

4'- -4'- -(N- -N-[3-{2- -2- }]) B1.

I , :

(A) R₁ I (1) , R₂가 , R₃ R₃₁-CH-R₃₂ (, R₃₁
C₁-C₆ , C₁-C₅ C₁-C₆ , R₃₂

R₁ I (1) , R₂ R₃ R₃₁ R₃₂가 I (, R₃
-C(=O)R₃₂ ;

(B) R₁ R₂가 I (1) , R₃ I (1)
 , R₃ la la (, R₁ R₂가 I (1) R₃ I
(1) , Hal , R₃-Hal ;

(C) R₁ R₂가 I (1) , R₃ -CH₂-C₁-C₁₁

R₁ R₂가 I (1) , R₃ -C(=O)-R₅ - C₁-C₁₁ , R₁
가 OH I ;

(D) R₁ R₂가 I (1) , R₃ COOH- C₁-C₁₂ -

R₁ R₂가 I (1) , R₃ -C(=O)-R₅ C₁-C₁₂ , R₅
가 C₁-C₆ I ;

(E) R₁ R₃ I (1) , R₂가 I ,
R₁ R₃ I (1) , R₂가 I ;
Hal , -Hal ;

(F) R₁ R₂가 I (1) , R₃ -C(=O)N(R₁₀)₂ - C₁-C₁₂
(, 2 R₁₀ C₁-C₁₂

R₁ R₂가 I (1) , R₃ -C(=O)R₅ - C₁-C₁₂ - , R₅
5가 OH I R₁₀ C₁-C₁₂

(G) R₁ R₂가 I (1) , R₃ C₄-C₁₂

R₁ R₂가 I (1) , R₃ -C(=O)R₅ - C₁-C₅ , R₅
가 C₁-C₁₂ ; C₁-C₃ C₁-C₃ 2

(H) R₁ I (1) , R₂ R₃ , CH₂ O, S NR₄
3 7 4 7 , R₄가 I (1)

(A)

(A)

2

60

90

P1.2, P1.3, P2.1 P2.7

(C):

(A)

가

0

P2.2

0

(D):

(A)

가

P2.6

Pd

가

P2.5

(E):

(B)

2

0

60

P2.3

NaCNBH₃

P2.4

(F):

(A)

; , , 가 .

, , 0 , .

, , P2.8 .

(G):

(A) ; , ; , .

0 , , 0 .

, , P2.10 .

(H):

(B) ; 2 , , .

0 , , 90 .

, , P3.2 .

(I):

(B) ; 2 , , .

0 , , 90 .

, , P3.1 .

(J):

2 (B) , , ;

0 , , .

, , P3.3 .

가 ; , , ; , , 가 .

(HPLC)

가 .

가 / 가 / 가 ,가 (moulting) / , 50 60% 736 252 , 5 , 55 6 55

(Heterodora spp.), (Hetero dora schachtii), (Heterodora avenae) (Heterodora trifolii); (Globodera spp.), (Globodera rostochiensis); (Meloidogyn e spp.), (Meloidogyne incognita) (Meloidogyne javanic a); (Radopholus spp.), (Radopholus simiis); (Pratylench us), (Pratylenchus neglectans) (Pratylenchus pe netrans); (Tylenchulus), (Tylenchulus semipenetrans); (Longidorus), (Trichodorus), (Xiphinema), (Ditylenchus), (Aphelenchoides) (Anguina); (insbesondere Meloidogyne), (Heterodera glycines) (Meloidogyne incognita),

(plum), (lentil), (cucurbitaceae), (pome), (stone fruit) (beet), (poppy), (marrow), (grapefruit) (mandarins);

(lettuce), (paprika); (laurac
 eae), (avocado), (camphor); ,가 (sugar cane),
 (hop),

가
 가
 가
 가

가 (dust), (wettable powder),
 ()

(:) ()
 가 ,가 가
 가

)가 (

가 736 252 , 7 , 51 8 39

%, 0.1 ,가 95 % 가 0.1 1 99.9 %, 5 99.9 %
 , 0 25 %, 0.1 20 % 가

(acaricide) (nematocide) 가 가
 (pyrethroid), (Bacillus thuringiensis preparati
 on)

(azamethiphos); (chlorfenvinphos); (bu
 pirimate); (cypermethrin), - (cypermethrin high-cis); (cyromazine)
 ; (diafenthiuron); (diazinon); (dichlorvos); (dicrotophos);
 (dicyclanil); (fenoxycarb); (fluazuron); (furathiocarb); (isaz
 ofos); (iodfenphos); (kinoprene); (lufenuron); (methacriphos);
 (methidathion); (monocrotophos); (phosphamidon); (profenofos);
 (diofenolan); a substance obtainable from the GC91(Bacillus thuringien
 sis strain GC91) NCTC11821 가 ; (pymetrozine); (
 propylate); (methoprene); (disulfoton); (quinalphos); (taulfluv
 alinate); (thiocyclam); (thiometon); (aldicarb); (azinphos);
 (benfuracarb); (bifenthrin); (buprofezin); (carbofuran); ;
 (cartap); (chlorfluazuron); (chlorpyrifos) ; (cyfluthrin); -
 (-cypermethrin); - (-cypermethrin); - (-methrin); (diflub
 enzuron); (endosulfan); (ethiofencarb); (fenitrothion); (fenazaquin);
 (fenobucarb); (fenvalerate); (formothion); (methiocarb);
 (heptenophos); (imidacloprid); (isoprocarb); (methamidophos);
 (methomyl); (mevinphos); (parathion); ; (phosalone); (pirim
 icarb); (propoxur); (teflubenzuron); (terbufos); (triazamate);
 (abamectin); (fenobucarb); (tebufenozide); (fipronil); - (
 -cyfluthrin); (silaflluofen); (fenpyroximate); (pyridaben); (pri
 micarb); (pyriproxyfen); (pyrimidifen); (nematorin); (nitenpyram); NI
 -25, (acetamiprid); B₁ [(abamectin)]; ;
 ; (Bacillus subtilis) 가 ;

; AC 303 630; (acephate); (acrinathrin);
 (alanycarb); - (-methrin); (amitraz); AZ 60541; (azinphos) A;
 (azinphos) M; (azocyclotin); (bendiocarb); (bensultap); - (-
 cyfluthrin); BPMC; (brofenprox); (phos) A; (bufencarb); (but
 ocarboxim); (buthylpyridaben); (cadusafos); ; (carbophenothion);
 (chloethocarb); (chlorethoxyfos); (chlormephos); - -
 (cis- res-methrin); ; (clofentezine); (cyanophos); (cyclo
 prothrin); (cyhexatin); (demeton) M; S; S- ; ; (diclip
 hos); (diethion); (dimethoate); (di vinphos); (dioxathion);
 (edifenphos); (emamectin); (esfenvalerate); ; (ethofenprox
); (ethoprophos); (etrimphos); (fenamiphos); (fenbutatin o
 xide); (fenothiocarb); (fenpropathrin); (fenpyrad); (fenthion);
 (fluazinam); (flucycloxiuron); (flucythrinate); (flufenoxur
 on); (flufenprox); (fonophos); (fosthiazate); (fubfenprox); HC
 H; (hexaflumuron); (hexythiazox); IKI-220; (iprobenfos); (is
 ofenphos); ; - (-cyhalothrin); (melathion); (mecarbam);
 (mesulfenphos); (metaldehyd); (metolcarb); (milbemectin); (
 moxidectin); (naled); NC 184; (omethoate); (oxamyl); (oxydemethon) M;
 (oxydeprofos); (permethrin); (phenthoate); (phorate); (phos
 met); (phoxim); (pirimiphos) M; A; (promecarb); (propaphos);
 (prothiofos); (prothoate); (pyrachlophos); - (pyrada-phenth
 ion); (pyresmethrin); (pyrethrum); RH 5992; (salthion); (sebufos); (
 sulfotep); (sulprofos); (tebufenpyrad); (tebupirimphos); (tefluth
 rin); (temephos); (terbam); (tetrachlorvinphos); (thiaclopid);
 (thiamethoxam); (thiafenox); (thiodicarb); (thiofanox); (thi
 onazin); (thuringiensin); (tralomethrin); (triarathen); (triazopho
 s); (triazuron); (trichlorfon); (triflumuron); (trimethacarb);
 (vamidothion); (xylylcarb); YI 5301/5302; (zetamethrin); DPX-MP062; RH-248
 5 ; D 2341 XMC (3,5-)

(% %).

_____:					
	: 1	90	%,	5	20 %
	: 1	30	%,	10	20 %
	: 5	98	%,	70	85 %
_____:					
	: 0.1	10	%,	0.1	1 %
	: 99.9	90	%,	99.9	99 %
_____:					
	: 5	75	%,	10	50 %
	: 94	24	%,	88	30 %
	: 1	40	%,	2	30 %
_____:					
	: 0.5	90	%,	1	80 %

4'- -4'- - - B1 300mg 3Mℓ
 620mg 3Mℓ(1N) 가 . 18
) ; , (/ ,
 B1 4'- -4'- -N-(- -)- -

P2.1: 4'- -4'- -(N- -N-1- -3- -)- B1

4'- -4'- - - B1 600mg 6Mℓ 0.5
 6Mℓ 6Mℓ(1N) 가 . 60 18
 , ; , (/ ,
 B1 4'- -4'- -(N- -N-1- -3- -)-

P2.2: 4'- -4'- -(N-2- -N-)- B1

1: 4'- -4'- - - B1 4.55g 45Mℓ
 8.6g (1N) 45Mℓ 가 . 60 18
 /) , (/ ,
)- B1 4'- -4'- -(N- -N-

2: 4'- -4'- -(N- -N- -)- B1 300mg 6Mℓ
 1.3Mℓ(1.2mol/) 가 . 15
 (/) , 4'- -4'-
 -(N-2- -N-)- B1

P2.3: 4'- -4'- -(N- -N-)- B1

4'- -4'- - - B1 2.0g 20Mℓ
 4Mℓ 20Mℓ(1N) 가 , 60 14
) , (/ ,
 4'- -4'- -(N- -N-)- B1

P2.4: 4'- -4'- -(N- -N-)- B1

4'- -4'- - - B1 9.14g 100Mℓ 15Mℓ
 25Mℓ(37%) 가 . 0.7g 가 . 1
 /) , (/ ,
 1 4'- -4'- -(N- -N-)- B

P2.5: 4'- -4'- -(N- -N-)- B1

1: 4'- -4'- - - B1 10g 100Mℓ
 15.6g 100Mℓ(1N) 가 . 60 5
 /) , (/ ,
)- B1 4'- -4'- -(N- -N-

2: 4'- -4'- -(N- -N- -)- B1 7.8g
 100Mℓ 780mg(5%) 가 , 4'- -4'- -(N- -N-)-
)- B1

P2.6: 4'- -4'- -(N- -N-)- B1
 1: 4'- -4'- - B1 15g 120Mℓ
 26g 120Mℓ(1N) 가 ,
 (/) 4'-
 -4'- -(N- -N-)- B1
 2: 4'- -4'- -(N- -N-)- B1 10g 90
 Mℓ 10Mℓ 440mg 가 , 14
 % ; , (10
 -N-)- B1 4'- -4'- -(N-

P2.7: 4'- -4'- -(N- -N-)- B1
 4'- -4'- -N- - B1 8.0g 50Mℓ 1
 5Mℓ 50Mℓ(1N) 가 . 60 2 (/)
 4'- -4'- -(N- -N-)- B1

P2.8: 4'- -4'- -{N-[(1- -)]-]-N- }- B1
 4'- -4'- -(N- -N-)- B 500mgdmf 5Mℓ
 L- 170mg, 1- -7- 72mg N,N- ;
 110mg 가 7 (1N) ;
 (/)
 4'- -4'- -{N-[(1- -)]-]-N- }-
 B1

P2.9: 4'- -4'- -{N-[(1- -)]-]-N- }- B1
 4'- -4'- -{N-[(1- -)]-]-N- }- B1 160mg .3
 10Mℓ 50mg(5%) 가 , 4'- -4'- -{N-[(1-
 -)]-]-N- }- B1

P2.10: 4'- -4'- -[N-(2- -2- -N-)]- B1
 4'- -4'- -(N- -N- -)- B1 300mg(P2.2 1)
 6Mℓ , 0.64Mℓ(3mol/
) 가 .1 , (/)
 4'- -4'- -[N-(2- -2-)]-N-]- B1

P3.1: 4'- -4'- -[N,N- (1- -1- -3)]- B1
 4'- -4'- - B1 3.48g 40Mℓ .3- -1- -1-
 4.62g 40Mℓ(1N) 가 . 60 3 (/)
) 4'- -4'- -[N,N- (1- -1- -3-)]-
 B1

P3.2: 4'- -4'- -(-1-)- B1
 4'- -4'- - B1 300mg 1Mℓ .1,3- 0.106Mℓ
 1Mℓ(1N) 가 . 90 24 (/)
) 4'- -4'- -(-1-)- B1

P3.3: 4'- -4'- -[N,N- (3,3-)]- B1
 4'- -4'- - B1 0.87g 10Mℓ 1Mℓ, 0.1Mℓ
 3,3- 0.60g 가 , (1N) 0.38g 가
 14 . (/)
 4'- -4'- -[N,N- (3,3-)]- B1

P4.1: 4'- -4'- -[N-(3-)-N-]- B1
 4'- -4'- -[N-(3-)-N-]- B1 100mg 100mg
 N,N- 2Mℓ . 60 가 , 90 (1N)
 , / ,
 4'- -4'- -[N-(3-)-N-]- B1

P4.2: 4'- -4'- -[N-(3-)-N-]- B1
 4'- -4'- -N- B1 3g 1,3- 9Mℓ 9Mℓ
 18Mℓ(1N) 가 , 60 3
 , /
 B1 4'- -4'- -[N-(3-)-N-]-

P4.3: 4'- -4'- -N-(2-)- B1
 4'- -4'- -N- B1 872mg 5Mℓ 212mg 가
 3 4'- -4'- -N-(2-)- B1
 , 1 3 . 1 3 , ~~~

가) B1a B1b HPLC(80%
 . B1b R₁ . B1a R₁ 2 . B1a B1b
 2 B1a B1b B1a B1b HPLC
 . B1a B1b

HPLC			
A:	H ₂ O 0.01%		
B:	CH ₃ CN 0.01%		
[]	A[%]	B[%]	[/μℓ]
0	80	20	500
0.1	50	50	500
10	5	95	500
15	0	100	500
17	0	100	500
17.1	80	20	500
22	80	20	500
YMC-Pack ODS-AQ			

	125mm
	2mm
	40

(YMC)가

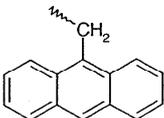
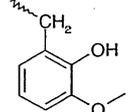
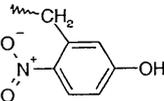
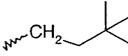
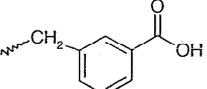
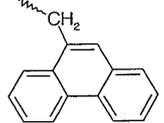
YMC-Pack ODS-AQ

46514

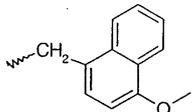
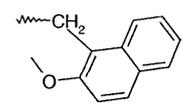
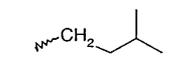
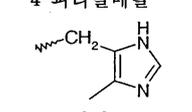
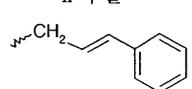
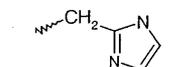
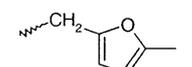
6

[1a]

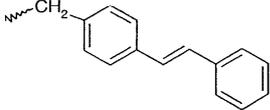
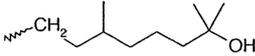
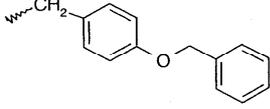
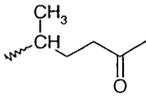
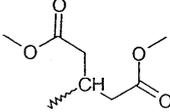
R₁이 2급 부틸(B1a) 또는 이소프로필(B1b)이고 R₂가 수소인 화학식 I의 화합물

화합물 번호	R ₃	유지 시간(분)	
		B1a	B1b
1.1		7.64	7.06
1.2		5.92	5.62
1.3	(3-니트로페닐)메틸	5.80	5.59
1.4	(4-디메틸아미노페닐)메틸	6.12	5.87
1.5	(3-브로모페닐)메틸	6.32	6.00
1.6		5.84	5.48
1.7	2-페닐-n-프로필	6.62/6.41	6.20/6.00
1.8	3-피리딜메틸	5.96	5.61
1.9	(2,4-디메틸페닐)메틸	6.59	6.22
1.10	(3-플루오로페닐)메틸	5.80	5.46
1.11		6.18	5.87
1.12		5.39	5.14
1.13		7.11	6.72

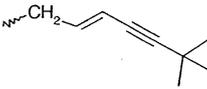
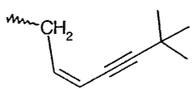
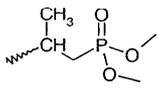
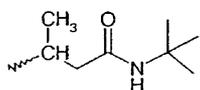
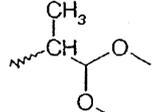
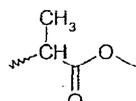
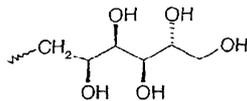
[1b]

화합물 번호	R ₃	유지 시간(분)	
		B1a	B1b
1.14	(3,4-메틸렌디옥시-6-니트로페닐)메틸	6.01	5.66
1.15		8.37	7.75
1.16	(2-하이드록시-5-메톡시페닐)메틸	5.64	5.26
1.17	(2-하이드록시-4-메톡시페닐)메틸	5.81	5.55
1.18	(2,3-디하이드록시페닐)메틸	5.45	5.10
1.19	(2-하이드록시-5-니트로페닐)메틸	6.28	5.92
1.20		6.73	6.34
1.21	테크-4-엔-1-일	7.96	7.54
1.22	(3-[4-메톡시페녹시]페닐)메틸	7.00	6.62
1.23		6.63	6.25
1.24	3-페닐- n-프로필	7.03	6.65
1.25	4-피리딜메틸	5.40	5.07
1.26		4.57	4.32
1.27	에틸	5.30	4.96
1.28	n-부틸	5.56	5.10
1.29		5.95	5.60
1.30	(2-브로모페닐)메틸	6.85	6.47
1.31		5.24	4.86
1.32		5.74	5.36
1.33	(4-n-프로폭시페닐)메틸	6.49	6.10

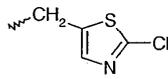
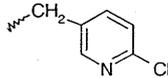
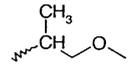
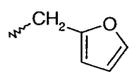
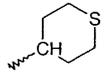
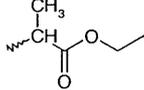
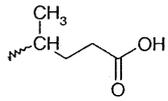
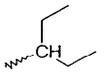
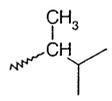
[1c]

화합물 번호	R ₃	유지 시간(분)	
		B1a	B1b
1.34		7.18	-
1.35	(2-클로로-4-하이드록시페닐)메틸	6.30	5.87
1.36	사이클로도데실	9.2	8.80
1.37	1-메틸- n-부틸	6.76/6.98	6.33/6.50
1.38	4-하이드록시-1-메틸- n-부틸	6.25	5.70
1.39	1-메틸-n-프로필	7.50	6.81
1.40		6.50	6.10
1.41	(4-3급-부틸페닐)메틸	7.31	6.98
1.42	3-페닐-n-부틸	7.22	6.90
1.43		6.84	6.56
1.44	-CH ₂ -C(=O)-O-CH ₂ -페닐	7.15	6.76
1.45	-CH ₂ -C(=O)-O-메틸	5.75	5.39
1.46	-CH ₂ -C(=O)-O-에틸	6.12	5.72
1.47		6.95	6.41
1.48		6.40	5.96
1.49		6.27	5.81

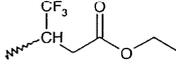
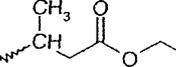
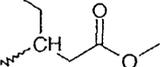
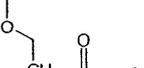
[1d]

화합물 번호	R ₃	유지 시간(분)	
		B1a	B1b
1.50		5.86	5.50
1.51		5.24	5.86
1.52		5.35	5.00
1.53		5.20	4.86
1.54	1,2-디메틸-3-하이드록시-n-프로필 사이클로부틸	5.71	5.30
1.55		5.61	5.24
1.56		7.42	6.90
1.57		6.47	6.02
1.58	-CH ₂ C(=O)-O-i-프로필	5.93	5.72
1.59	-CH ₂ -C(=O)-O-CH ₂ -CH ₂ -O-CH ₃	5.44	5.21
1.60	-CH ₂ C(=O)-O-3급-부틸	6.15	5.97
1.61	-CH ₂ C(=O)NH ₂	4.83	4.58
1.62		6.13	5.67
1.63		3.46	3.26

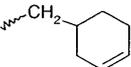
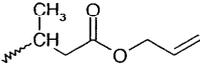
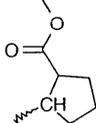
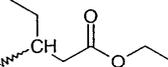
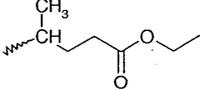
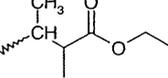
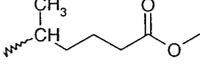
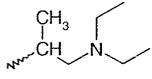
[1e]

화합물 번호	R ₃	유지 시간(분)	
		B1a	B1b
1.64	프로파르질	5.36	4.97
1.65	2-클로로알릴	5.93	5.51
1.66	3,3-디클로로알릴	6.12	5.72
1.67		5.97	5.59
1.68		5.57	5.24
1.69			
1.70			
1.71	1-사이클로프로필에틸		
1.72			
1.73			
1.74			
1.75	2,2-디메틸-n-프로필		
1.76			
1.77			

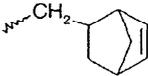
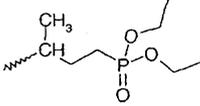
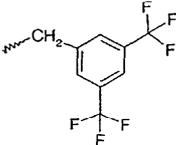
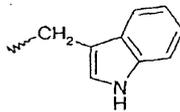
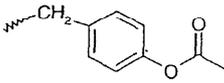
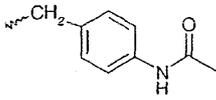
[1f]

화합물 번호	R ₃	유지 시간(분)	
		B1a	B1b
1.78			
1.79			
1.80			
1.81			
1.82			
1.83	(펜타플루오로페닐)메틸		
1.84	(2,3,5-트리클로로페닐)메틸		
1.85	(2,3,6-트리클로로페닐)메틸		
1.86	(2,3,4-트리플루오로페닐)메틸		
1.87	(2,6-디클로로페닐)메틸		
1.88	(2,3-디클로로페닐)메틸		
1.89	(2-하이드록시-3,5-디클로로페닐)메틸		
1.90	(2-클로로-6-플루오로페닐)메틸		
1.91	(2-클로로-6-니트로페닐)메틸		
1.92	(3-클로로-4-니트로페닐)메틸		
1.93	(2-클로로-5-니트로페닐)메틸		
1.94	(2,6-디플루오로페닐)메틸		
1.95	(2,3-디플루오로페닐)메틸		
1.96	(2-하이드록시-5-브로모페닐)메틸		
1.97	(2-하이드록시-5-클로로페닐)메틸		
1.98	(3-니트로-4-하이드록시페닐)메틸		
1.99	(3-하이드록시-4-니트로페닐)메틸		
1.100	(3-하이드록시페닐)메틸		
1.101	(2-하이드록시페닐)메틸		
1.102	(2,5-디하이드록시페닐)메틸		
1.103	3-트리플루오로메틸사이클로헥실		

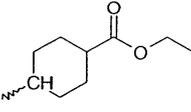
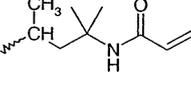
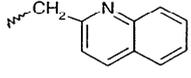
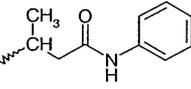
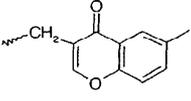
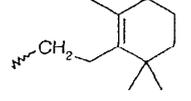
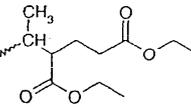
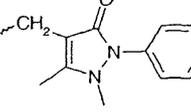
[1g]

화합물 번호	R ₃	유지 시간(분)	
		B1a	B1b
1.104			
1.105			
1.106			
1.107			
1.108			
1.109			
1.110			
1.111			
1.112			
1.113	(2-트리플루오로메틸페닐)메틸		
1.114	(3-트리플루오로메톡시페닐)메틸		
1.115	(3-시아노페닐)메틸		
1.116	(2,3-메틸렌디옥시페닐)메틸		
1.117	(2-메톡시-5-브로모페닐)메틸		
1.118	(3-브로모-4-하이드록시-5-메톡시페닐)메틸		

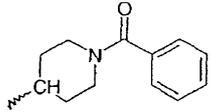
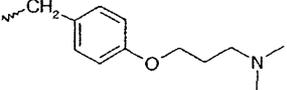
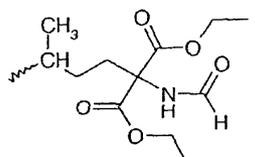
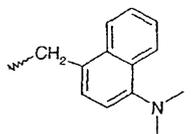
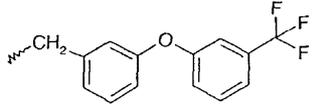
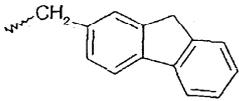
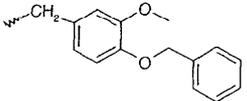
[1h]

화합물 번호	R ₃	유지 시간(분)	
		B1a	B1b
1.119	(2-니트로-3-메톡시페닐)메틸		
1.120	(4-메톡시페닐)메틸		
1.121	(3-하이드록시-4-메톡시페닐)메틸		
1.122			
1.123	2-에틸헥실		
1.124			
1.125			
1.126	[4-(1,1,2,2-테트라플루오로-에톡시)-페닐]-메틸		
1.127			
1.128			
1.129	(3-브로모-4,6-디메톡시페닐)메틸		
1.130	(2-브로모-4,5-디메톡시페닐)메틸		
1.131			
1.132	(2-니트로-4,5-디메톡시페닐)메틸		
1.133	2-벤질옥시에틸		
1.134	(3,5-디메틸-4-하이드록시페닐)메틸		
1.135	(2-하이드록시-4,6-디메톡시페닐)메틸		

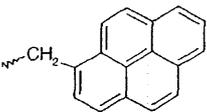
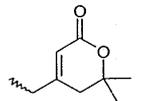
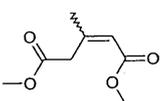
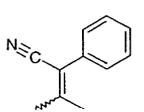
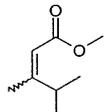
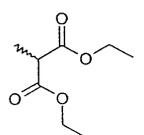
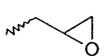
[1i]

화합물 번호	R ₃	유지 시간(분)	
		B1a	B1b
1.136			
1.137			
1.138			
1.139			
1.140	(2,4,6-트리메틸페닐)메틸		
1.141	3,7-디메틸옥트-6-엔-1-일		
1.142	나프트-1-일		
1.143	나프트-2-일		
1.144			
1.145			
1.146			
1.147			

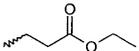
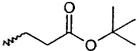
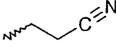
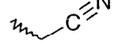
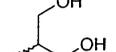
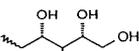
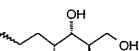
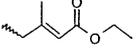
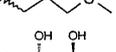
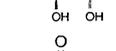
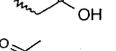
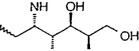
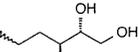
[1j]

화합물 번호	R ₃	유지 시간(분)	
		B1a	B1b
1.148			
1.149			
1.150			
1.151	n-도데실		
1.152	(3-[3,4-디클로로페녹시]페닐)메틸		
1.153	(3-[4-클로로페녹시]페닐)메틸		
1.154			
1.155			
1.156			
1.157			

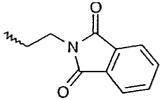
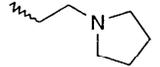
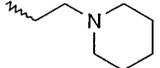
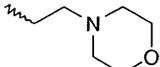
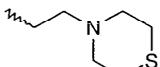
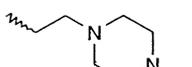
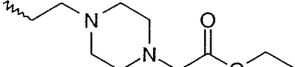
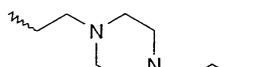
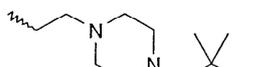
[1k]

화합물 번호	R ₃	유지 시간(분)	
		B1a	B1b
1.158			
1.159			
1.160		11.03	10.39
1.161		12.27	11.70
1.162		12.28	
1.163	n-프로필	5.42	5.08
1.164	이소-부틸	5.49	5.26
1.165	3,3,3-트리플루오메틸	5.55	5.23
1.166	3-하이드록시프로필	4.83	4.54
1.167		10.79	10.24
1.168		4.91	4.54
1.169	n-펜틸	5.42	5.17
1.170	n-헥실	5.82	5.55
1.171	n-헵틸	6.18	5.87
1.172	n-노닐	7.10	6.83
1.173	n-데실	7.53	7.21

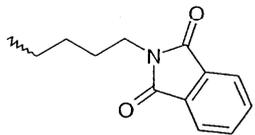
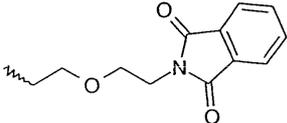
[11]

화합물 번호	R ₃	유지 시간(분)	
		B1a	B1b
1.174		5.12	4.79
1.175		5.72	5.45
1.176		4.57	4.18
1.177		9.01	8.37
1.178		4.64	4.43
1.179		4.12	
1.180	알킬	4.91	4.59
1.181		3.99	3.75
1.182		5.49	5.12
1.183		5.28	4.91
1.184		4.27	4.00
1.185		5.43	
1.186		4.09	
1.187		4.98	4.67
1.188		4.16	3.89
1.189	2-페닐에틸	5.49	5.12

[1m]

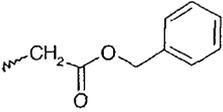
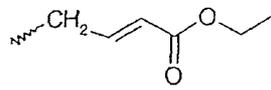
화합물 번호	R ₃	유지 시간(분)	
		B1a	B1b
1.190		5.23	4.96
1.191	-(CH ₂) ₂ NH ₂		
1.192	-(CH ₂) ₂ N(CH ₃) ₂		
1.193			
1.194			
1.195			
1.196			
1.197			
1.198			
1.199			
1.200			
1.201			

[1n]

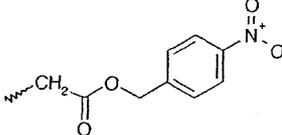
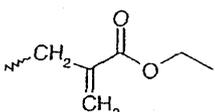
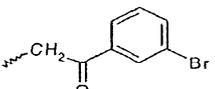
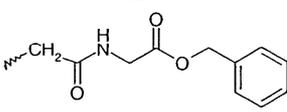
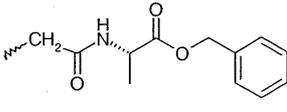
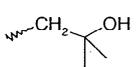
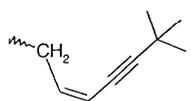
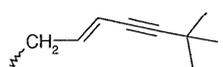
화합물 번호	R ₃	유지 시간(분)	
		B1a	B1b
1.202			
1.203			

[2a]

R₁ 이 2급 부틸(B1a) 또는 이소프로필(B1b)이고 R₂가 메틸인 화학식 I의 화합물

화합물 번호	R ₃	유지 시간(분)	
		B1a	B1b
2.1	벤질	6.20	5.75
2.2	알릴	5.53	5.25
2.3	-CH ₂ -C(=O)-O-에틸	6.57	6.05
2.4	2-하이드록시에틸	4.27	3.97
2.5	-CH ₂ -C(=O)-O-메틸	6.09	5.66
2.6	부트-2-엔-1-일	6.11	5.66
2.7		7.53	7.08
2.8	-CH ₂ -C(=O)-O-t-부틸	7.05	6.59
2.9	(4-플루오로-2-트리플루오로메틸페닐)메틸	9.49	8.97
2.10	(4-플루오로-3-트리플루오로메틸페닐)메틸	7.25	6.61
2.11	(3,4-디플루오로페닐)메틸	6.55	6.11
2.12	이소프로필	4.48	4.13
2.13	(3-트리플루오로메틸페닐)메틸	7.38	6.96
2.14		6.40	5.99

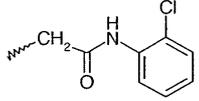
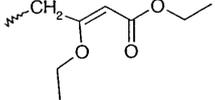
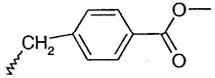
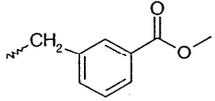
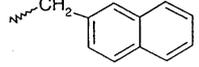
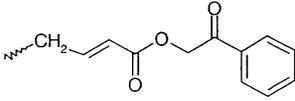
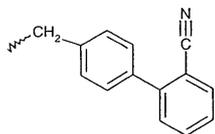
[2b]

화합물 번호	R ₃	유지 시간(분)	
		B1a	B1b
2.15	2-메틸알릴	6.19	5.88
2.16	-CH ₂ -C(=O)-OH	6.42	5.91
2.17	-CH ₂ -C(=O)-NH ₂	5.27	4.97
2.18		8.18	7.69
2.19	(2-메틸페닐)메틸	7.02	6.59
2.20		6.55	6.15
2.21		5.20	5.00
2.22	에틸	5.11	4.67
2.23		7.08	6.62
2.24		6.95	6.55
2.25		4.98	4.55
2.26	(4-페닐페닐)메틸	7.84	7.43
2.27		7.86	7.59
2.28		6.56	6.12

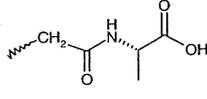
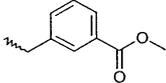
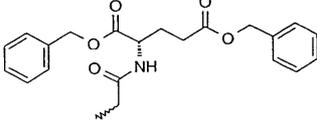
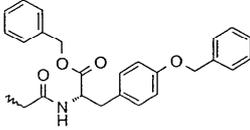
[2c]

화합물 번호	R ₃	유지 시간(분)	
		B1a	B1b
2.29	(4- <i>l</i> -부틸페닐)메틸	8.32	7.94
2.30	(4-플루오로페닐)메틸	6.88	6.49
2.31	(4-브로모페닐)메틸	7.50	7.07
2.32	2-브로모알릴		
2.33	-CH ₂ -C(=O)-O-		
2.34	-CH ₂ -C(=O)-O-CH ₂ -CH ₂ -O-CH ₃		
2.35	(2,3,4-트리플루오로페닐)메틸		
2.36	(2,4,5-트리플루오로페닐)메틸		
2.37	(2,3,6-트리플루오로페닐)메틸		
2.38	(3,5-디브로모페닐)메틸		
2.39	(3-플루오로-6-브로모페닐)메틸		
2.40	(2,3-디클로로페닐)메틸		
2.41	(2,6-디클로로페닐)메틸		
2.42	(2,5-디클로로페닐)메틸		
2.43	(3,4-디클로로페닐)메틸		
2.44	(2-플루오로-3-클로로페닐)메틸		
2.45	(2-클로로-4-플루오로페닐)메틸		
2.46	(2,5-디플루오로페닐)메틸		
2.47	(2,6-디플루오로페닐)메틸		
2.48	(2,3-디플루오로페닐)메틸		
2.49	(3,5-디플루오로페닐)메틸		
2.50	(3-브로모페닐)메틸		
2.51	(2-클로로페닐)메틸		
2.52	(2-플루오로페닐)메틸		
2.53	(3-플루오로페닐)메틸		
2.54	(4-요오도페닐)메틸		
2.55	(2-요오도페닐)메틸		
2.56	(4-니트로페닐)메틸		
2.57	(3-니트로페닐)메틸		
2.58	(2-클로로-5-[트리플루오로메틸]페닐)메틸		
2.59	(3-플루오로-5-[트리플루오로메틸]페닐)메틸		
2.60	(3,5-디클로로페닐)메틸		
2.61	(2-트리플루오로메틸페닐)메틸		
2.62	(3-트리플루오로메톡시페닐)메틸		
2.63	(4-시아노페닐)메틸		
2.64	(2-시아노페닐)메틸		

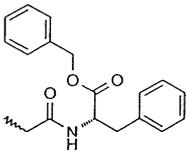
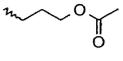
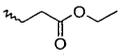
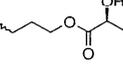
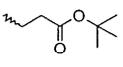
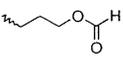
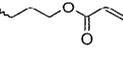
[2d]

화합물 번호	R ₃	유지 시간(분)	
		B1a	B1b
2.65	(3-시아노페닐)메틸		
2.66	(2,3-디클로로-4-메톡시페닐)메틸		
2.67			
2.68	(4-디플루오로메톡시페닐)메틸	7.88	7.56
2.69	(2-플루오로-3-메틸페닐)메틸		
2.70			
2.71	([3,5-비스-트리플루오로메틸]페닐)메틸		
2.72	([2,4-비스-트리플루오로메틸]페닐)메틸		
2.73			
2.74			
2.75	(3,5-디메틸페닐)메틸		
2.76	(2-메톡시-4-메톡시카보닐페닐)메틸		
2.77			
2.78		6.94	6.67
2.79	(2-페닐페닐)메틸		
2.80	(4-페닐페닐)메틸		
2.81			
2.82	n-프로필	5.18	4.81

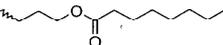
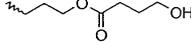
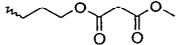
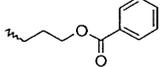
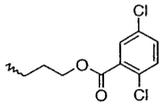
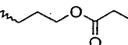
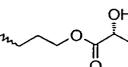
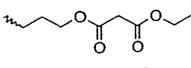
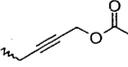
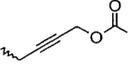
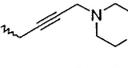
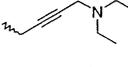
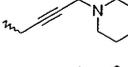
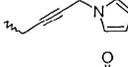
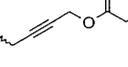
[2e]

화합물 번호	R ₃	유지 시간(분)	
		B1a	B1b
2.83	이소프로필		
2.84	n-부틸	5.77	5.34
2.85	n-펜틸	5.93	5.55
2.86	n-헥실	6.52	6.09
2.87	n-헵틸	7.10	6.62
2.88	n-옥틸	7.32	7.00
2.89	이소부틸	5.66	5.23
2.90	2급-부틸		
2.91	3급-부틸		
2.92	이소펜틸	5.98	5.61
2.93	네오펜틸	5.99	5.49
2.94	이소헥실		
2.95		5.61	5.18
2.96			
2.97	트리플루오로메틸	10.60	
2.98	프로파르질	6.63	6.25
2.99		8.54	
2.100	3,3-디클로로알릴	5.99	5.61
2.101	2-클로로알릴	7.63	7.04
2.102	3,3,3-트리플루오로프로필	6.14	5.66
2.103		9.34	

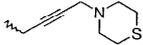
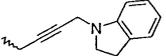
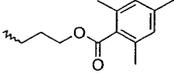
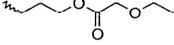
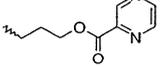
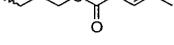
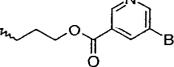
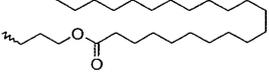
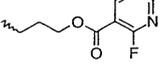
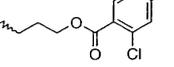
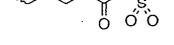
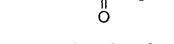
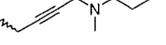
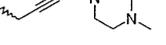
[2f]

화합물 번호	R ₃	유지 시간(분)	
		B1a	B1b
2.104		8.41	
2.105	3-하이드록시프로필	4.70	4.38
2.106	n-노닐	7.74	7.42
2.107	n-데실	8.38	8.06
2.108	3-요오도프로필	5.12	4.75
2.109	사이클로부틸	5.50	5.13
2.110	-(CH ₂) ₃ N(CH ₃) ₂	3.41	3.04
2.111	-(CH ₂) ₃ NH ₂	3.29	
2.112	-(CH ₂) ₃ NHCH ₃	3.37	
2.113		4.77	4.38
2.114		5.58	5.09
2.115	-CH ₂ -CH=CH-CH ₂ -Cl	5.71	5.29
2.116	-CH ₂ -CH=CH-CH ₂ -N(CH ₃) ₂	3.26	3.07
2.117		5.60	5.28
2.118	-CH ₂ -CH ₂ -CN	5.66	5.28
2.119			
2.120		6.29	5.92
2.121		5.74	5.39
2.122	-CH ₂ -CN	10.23	
2.123		5.33	5.02
2.124		5.07	4.76
2.125		5.24	5.01

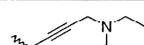
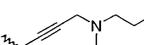
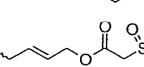
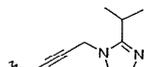
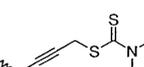
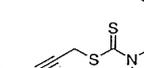
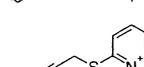
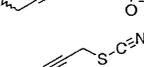
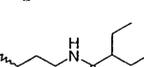
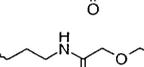
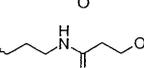
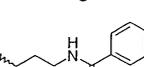
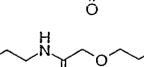
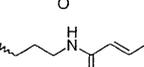
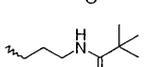
[2g]

화합물 번호	R ₃	유지 시간(분)	
		B1a	B1b
2.126		7.74	7.47
2.127		4.70	4.43
2.128		5.17	4.87
2.129		6.17	5.88
2.130		6.88	6.51
2.131		5.60	5.28
2.132		4.75	4.46
2.133		5.59	
2.134		5.39	5.01
2.135		5.33	4.91
2.136		3.83	3.63
2.137		4.08	3.78
2.138		4.77	4.45
2.139		3.80	3.60
2.140		7.86	7.37
2.141		5.81	5.39

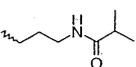
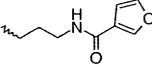
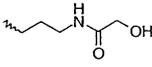
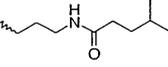
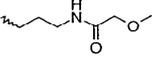
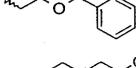
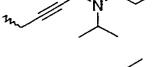
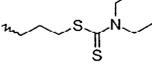
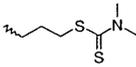
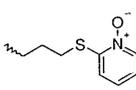
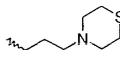
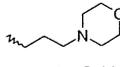
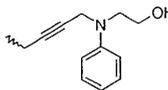
[2h]

화합물 번호	R ₃	유지 시간(분)	
		B1a	B1b
2.142		4.91	4.54
2.143		6.36	5.94
2.144		7.80	7.35
2.145		7.27	6.76
2.146		6.83	6.29
2.147		8.22	7.78
2.148		8.11	7.63
2.149		13.55	13.30
2.150		5.37	5.13
2.151		6.43	6.03
2.152		4.86	4.59
2.153		5.01	4.75
2.154		3.81	3.64
2.155		3.91	3.70
2.156		3.48	3.31

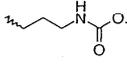
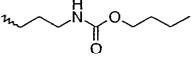
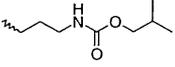
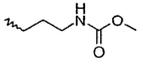
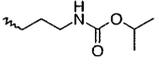
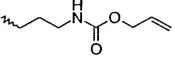
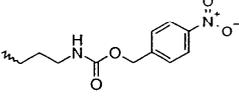
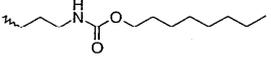
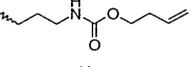
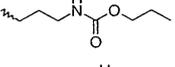
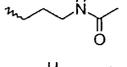
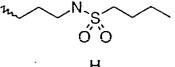
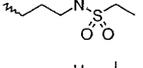
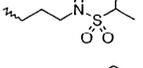
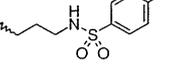
[2i]

화합물 번호	R ₃	유지 시간(분)	
		B1a	B1b
2.157		3.63	3.41
2.158		4.11	3.79
2.159		5.04	
2.160		3.72	
2.161		4.05	3.84
2.162		3.79	3.52
2.163		4.67	4.37
2.164		5.50	5.11
2.165		5.49	5.17
2.166		4.80	4.48
2.167		4.75	4.53
2.168		5.33	4.96
2.169		4.64	4.37
2.170		4.85	4.48
2.171		5.49	5.07

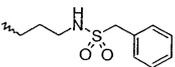
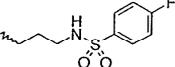
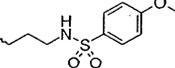
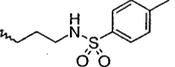
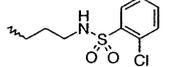
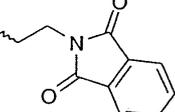
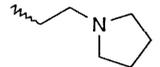
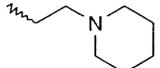
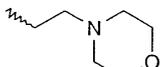
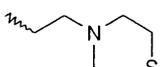
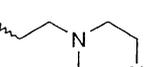
[2j]

화합물 번호	R ₃	유지 시간(분)	
		B1a	B1b
2.172		4.96	4.64
2.173		4.85	4.59
2.174		4.37	4.11
2.175		5.60	5.28
2.176		4.59	4.27
2.177		6.29	5.87
2.178		3.52	3.36
2.179		6.56	6.08
2.180		5.81	5.44
2.181	$-(CH_2)_3-SCN$	5.16	
2.182		4.69	
2.183	$-(CH_2)_2-C_6H_5$	6.13	5.71
2.184		3.52	3.36
2.185		3.58	3.36
2.186	$-(CH_2)_3-C_6H_5$	6.40	5.92
2.187		5.55	5.17

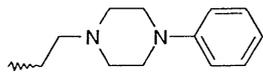
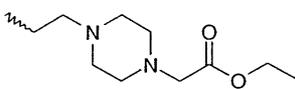
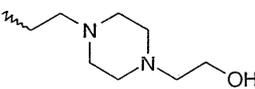
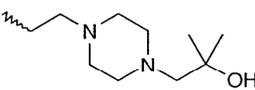
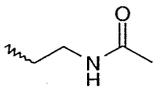
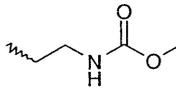
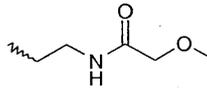
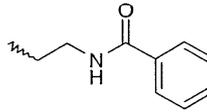
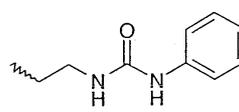
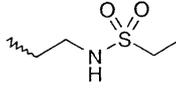
[2k]

화합물 번호	R ₃	유지 시간(분)	
		B1a	B1b
2.188		5.23	4.96
2.189		5.87	5.55
2.190		6.03	5.65
2.191		4.91	4.64
2.192		5.44	5.12
2.193		5.55	5.23
2.194		5.71	5.44
2.195		7.69	7.36
2.196		5.60	5.28
2.197		5.71	5.33
2.198		4.48	4.21
2.199		5.28	4.96
2.200		4.80	4.53
2.201		5.07	4.80
2.202		5.81	5.49

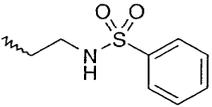
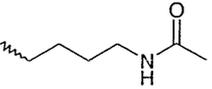
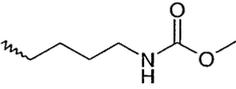
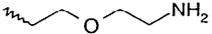
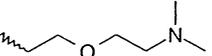
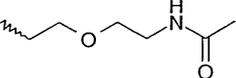
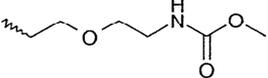
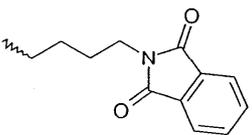
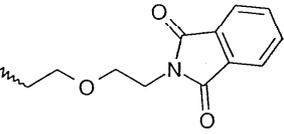
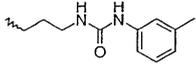
[21]

화합물 번호	R ₃	유지 시간(분)	
		B1a	B1b
2.203		5.63	5.31
2.204		5.82	5.44
2.205		5.71	5.44
2.206		5.92	5.60
2.207		5.98	5.60
2.208			
2.209	$-(\text{CH}_2)_2\text{NH}_2$		
2.210	$-(\text{CH}_2)_2\text{N}(\text{CH}_3)_2$		
2.211			
2.212			
2.213			
2.214			
2.215			

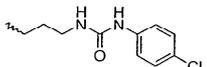
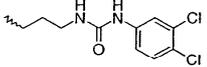
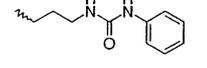
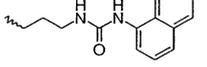
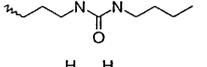
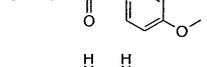
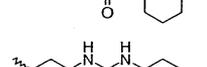
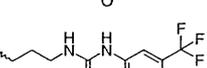
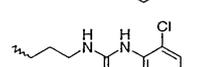
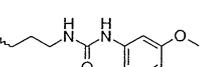
[2m]

화합물 번호	R ₃	유지 시간(분)	
		B1a	B1b
2.216			
2.217			
2.218			
2.219			
2.220			
2.221			
2.222			
2.223			
2.224			
2.225			

[2n]

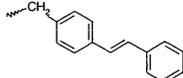
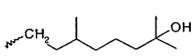
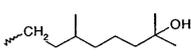
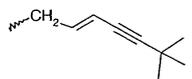
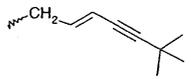
화합물 번호	R ₃	유지 시간(분)	
		B1a	B1b
2.226			
2.227	-(CH ₂) ₄ NH ₂		
2.228	-(CH ₂) ₄ N(CH ₃) ₂		
2.229			
2.230			
2.231			
2.232			
2.233			
2.234			
2.235			
2.236			
2.237			

[20]

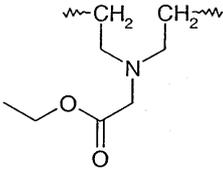
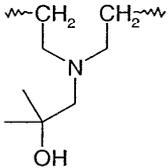
화합물 번호	R ₃	유지 시간(분)	
		B1a	B1b
2.238			
2.239			
2.240			
2.241			
2.242			
2.243			
2.244			
2.245			
2.246			
2.247			
2.248			

[3a]

R₁ 이 2급 부틸(B1a) 또는 이소프로필(B1b)인 화학식 I의 화합물

화합물 번호	R ₂	R ₃	유지 시간(분)	
			B1a	B1b
3.1	3-페닐알릴	3-페닐알릴	8.54	8.08
3.2		-(CH ₂) ₄ -	5.69	5.28
3.3		-(CH ₂) ₃ -	5.50	5.13
3.4	3-페닐-n-프로필	3-페닐-n-프로필	8.46	7.99
3.5	3,7-디메틸옥트-6-엔-1-일	3,7-디메틸옥트-6-엔-1-일	10.74	10.57
3.6	에틸		8.28	-
3.7	에틸	에틸	5.73	5.31
3.8	-CH ₂ CH ₂ C(CH ₃) ₃	-CH ₂ CH ₂ C(CH ₃) ₃	9.11	8.64
3.9			8.34	7.85
3.10		-CH ₂ -CH(OH)-CH ₂ -		5.12
3.11		-CH ₂ -CH ₂ -CH(OH)-CH ₂ -	5.53	5.15
3.12			10.75	10.36
3.13	에틸	벤질		
3.14	에틸	알릴	4.38	4.11
3.15	에틸	-CH ₂ C(=O)OC ₂ H ₅	6.21	5.74
3.16	3-메틸-n-부틸	3-메틸-n-부틸		
3.17	3-페닐-n-부틸	3-페닐-n-부틸		
3.18	에틸	n-프로필		
3.19	에틸	이소프로필		
3.20	에틸	n-부틸		
3.21	에틸	펜틸		
3.22	에틸	헥실		
3.23	에틸	헵틸		
3.24	에틸	n-옥틸		
3.25	에틸	2급-부틸		
3.26	에틸	3급-부틸		
3.27	에틸	이소펜틸		
3.28	에틸	네오펀틸		

[3b]

화합물 번호	R ₂	R ₃	유지 시간(분)	
			B1a	B1b
3.29	에틸	이소헥실		
3.30		-(CH ₂) ₅ -		
3.31	-(CH ₂)-사이클로프로필	-(CH ₂)-사이클로프로필	6.13	5.71
3.32		-(CH ₂) ₂ -O-(CH ₂) ₂ -		
3.33		-(CH ₂) ₂ -S-(CH ₂) ₂ -		
3.34		-(CH ₂) ₂ -NH-(CH ₂) ₂ -		
3.35		-(CH ₂) ₂ -NCH ₃ -(CH ₂) ₂ -		
3.36		-(CH ₂) ₂ -N(i-프로필)-(CH ₂) ₂ -		
3.37		-(CH ₂) ₂ -N(CH ₂ CH ₂ OH)-(CH ₂) ₂ -		
3.38				
3.39				
3.40		-(CH ₂) ₂ -N(C(=O)CH ₃)-(CH ₂) ₂ -		
3.41		-(CH ₂) ₂ -N(C ₆ H ₅)-(CH ₂) ₂ -		
3.42		-(CH ₂) ₂ -N(CH ₂ C ₆ H ₅)-(CH ₂) ₂ -		

_____ (% = %)

F1: _____ a) b) C)

5% 8% 6%

(EO 36mol) 5% - -

(EO 30mol) - 12% 4%

- 15% 20%

65% 25% 20%

가

F2: _____ a) b) C) d)

80% 10% 5% 95%

- 20% - -

(400) - - 70% -

N- -2- 20% - - -

- - - 1%

(: 160 190) - - 94% -

가

F3: a) b) C) d)

5% 10% 8% 21%

94% - 79% 54%

1% - 13% 7%

(Attapulgite) - 90% - 18%

F4: a) b) C)

25% 50% 75%

5% 5% -

3% - 5%

- 6% 10%

(EO 7 8mol)

- 2% -

5% 10% 10%

62% 27% -

가

F5:

10%

(EO 4 5mol) 3%

3%

(EO 36mol) 4%

30%

50%

가

F6:

0.8M2

. 6 가
(%)

1.001, 1.002, 1.003, 1.004, 1.005, 1.006, 1.007, 1.008, 1.009, 1.010, 1.011,
1.012, 1.013, 1.014, 1.015, 1.016, 1.017, 1.018, 1.019, 1.020, 1.021, 1.022, 1.023, 1.024,
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1.147, 1.148, 1.149, 1.150, 1.151, 1.152, 1.153, 1.154, 1.155, 1.156, 1.157, 1.158, 2.001,
2.002, 2.003, 2.005, 2.006, 2.007, 2.008, 2.009, 2.010, 2.011, 2.012, 2.013, 2.014, 2.015,
2.016, 2.017, 2.018, 2.019, 2.020, 2.021, 2.026, 2.027, 2.028, 2.029, 2.030, 2.031, 2.032,
2.033, 2.034, 2.035, 2.036, 2.037, 2.038, 2.039, 2.040, 2.042, 2.043, 2.044, 2.045, 2.046,
2.047, 2.048, 2.049, 2.050, 2.051, 2.052, 2.053, 2.054, 2.055, 2.056, 2.057, 2.058, 2.059,
2.062, 2.063, 2.064, 2.066, 2.067, 2.068, 2.069, 2.070, 2.071, 2.073, 2.074, 2.075, 2.076,
2.077, 2.078, 2.079, 2.080, 2.081, 3.001, 3.002, 3.003, 3.004, 3.005, 3.006, 3.007, 3.008,
3.009 및 3.010

80%

B4: (Plutella xylostella)

12.5ppm

1 10

가 . 3
) (%)

1.001, 1.002, 1.003, 1.004, 1.005, 1.006, 1.007, 1.008,
1.009, 1.010, 1.011, 1.012, 1.013, 1.014, 1.015, 1.016, 1.017, 1.018, 1.019, 1.020, 1.021,
1.022, 1.023, 1.024, 1.025, 1.026, 1.027, 1.028, 1.029, 1.030, 1.031, 1.032, 1.033, 1.034,
1.035, 1.037, 1.038, 1.039, 1.040, 1.041, 1.042, 1.043, 1.046, 1.050, 1.051, 1.052, 1.053,
1.054, 1.055, 1.056, 1.057, 1.058, 1.060, 1.061, 1.070, 1.075, 1.082, 1.083, 1.084, 1.085,
1.086, 1.087, 1.088, 1.089, 1.090, 1.091, 1.092, 1.093, 1.094, 1.095, 1.096, 1.097, 1.098,
1.099, 1.100, 1.101, 1.102, 1.104, 1.113, 1.114, 1.115, 1.116, 1.117, 1.118, 1.119, 1.120,
1.121, 1.122, 1.123, 1.125, 1.126, 1.127, 1.128, 1.129, 1.130, 1.131, 1.132, 1.133, 1.134,
1.135, 1.138, 1.140, 1.141, 1.142, 1.143, 1.144, 1.145, 1.147, 1.149, 1.151, 1.152, 1.153,
1.154, 1.155, 1.156, 1.157, 1.158, 2.001, 2.002, 2.003, 2.005, 2.006, 2.007, 2.008, 2.009,
2.010, 2.011, 2.012, 2.013, 2.014, 2.015, 2.017, 2.018, 2.019, 2.020, 2.021, 2.022, 2.026,
2.027, 2.028, 2.029, 2.030, 2.031, 2.032, 2.033, 2.034, 2.035, 2.042, 2.046, 2.057, 2.068,
2.070, 2.073, 2.077, 2.078, 3.001, 3.002, 3.003, 3.004, 3.005, 3.006, 3.007, 3.008 및 3.009 80%

B5: (Frankliniella occidentalis)

(disc)

. 10 가
(%)

1.027, 1.037, 1.038, 1.039, 1.040, 1.050, 1.061, 1.065,
 1.068, 1.082, 2.005, 2.006, 2.007, 2.008, 2.009, 2.010, 2.011, 2.012, 2.013, 2.014, 2.015,
 2.016, 2.017, 2.018, 2.020, 2.021, 2.026, 2.027, 2.028, 2.029, 2.030, 2.032, 2.033, 2.034,
 2.036, 2.038, 2.040, 2.042, 2.046, 2.047, 2.049, 2.050, 2.051, 2.055, 2.057, 2.062, 2.070,
 2.071, 2.072, 3.003, 3.006 및 3.012

80%

B6 : (Diabrotica balteata)

12.5ppm
 2 10 , , 6
 (%)

1.002, 1.003, 1.004, 1.005, 1.006, 1.007, 1.008, 1.009, 1.010, 1.011, 1.012,
 1.013, 1.014, 1.015, 1.016, 1.017, 1.018, 1.019, 1.020, 1.021, 1.022, 1.023, 1.024, 1.025,
 1.027, 1.028, 1.029, 1.030, 1.031, 1.032, 1.033, 1.034, 1.035, 1.037, 1.038, 1.039, 1.040,
 1.041, 1.042, 1.043, 1.045, 1.046, 1.047, 1.048, 1.052, 1.053, 1.054, 1.055, 1.056, 1.057,
 1.058, 1.059, 1.063, 1.064, 1.065, 1.066, 1.067, 1.068, 1.069, 1.070, 1.071, 1.072, 1.074,
 1.075, 1.076, 1.077, 1.078, 1.079, 1.080, 1.081, 1.082, 1.083, 1.084, 1.085, 1.086, 1.087,
 1.088, 1.090, 1.091, 1.092, 1.093, 1.094, 1.095, 1.096, 1.097, 1.098, 1.099, 1.100, 1.101,
 1.102, 1.104, 1.105, 1.107, 1.108, 1.109, 1.111, 1.113, 1.114, 1.115, 1.116, 1.117, 1.118,
 1.119, 1.120, 1.121, 1.122, 1.123, 1.125, 1.126, 1.127, 1.128, 1.129, 1.130, 1.131, 1.132,
 1.133, 1.134, 1.135, 1.136, 1.137, 1.138, 1.139, 1.140, 1.141, 1.142, 1.143, 1.144, 1.145,
 1.147, 1.148, 1.149, 1.150, 1.151, 1.152, 1.153, 1.154, 1.155, 1.156, 1.157, 1.158, 2.001,
 2.002, 2.003, 2.004, 2.005, 2.006, 2.007, 2.008, 2.009, 2.010, 2.011, 2.012, 2.013, 2.014,
 2.015, 2.016, 2.017, 2.018, 2.019, 2.020, 2.021, 2.022, 2.025, 2.026, 2.027, 2.028, 2.030,
 2.031, 2.032, 2.033, 2.034, 2.046, 2.050, 2.051, 2.052, 2.056, 2.073, 2.074, 2.076, 2.077,
 3.001, 3.002, 3.004, 3.005, 3.006, 3.007, 3.008 및 3.009

80%

B7: (Tetranychs urticae)

, 25 6 , 1 , 12.5ppm
 , 가
 (%)

1.001, 1.002, 1.003, 1.004, 1.005, 1.006, 1.007, 1.008, 1.009, 1.010, 1.011,
 1.012, 1.013, 1.014, 1.015, 1.016, 1.017, 1.018, 1.019, 1.020, 1.021, 1.022, 1.023, 1.024,
 1.025, 1.026, 1.027, 1.028, 1.029, 1.030, 1.031, 1.032, 1.033, 1.034, 1.035, 1.036, 1.037,
 1.038, 1.039, 1.040, 1.041, 1.042, 1.043, 1.044, 1.045, 1.046, 1.047, 1.048, 1.049, 1.050,

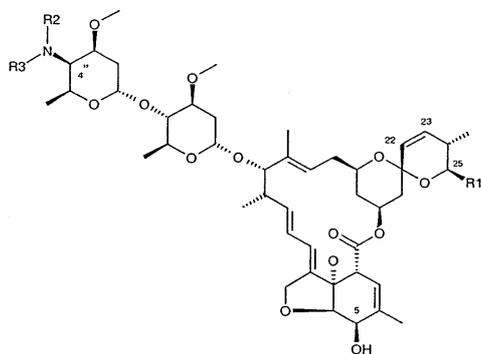
1.051, 1.052, 1.053, 1.054, 1.055, 1.056, 1.057, 1.058, 1.059, 1.060, 1.061, 1.062, 1.063, 1.064, 1.065, 1.066, 1.067, 1.068, 1.069, 1.070, 1.071, 1.072, 1.073, 1.074, 1.075, 1.076, 1.077, 1.078, 1.079, 1.080, 1.081, 1.082, 1.083, 1.084, 1.085, 1.086, 1.087, 1.088, 1.089, 1.090, 1.091, 1.092, 1.093, 1.094, 1.095, 1.096, 1.097, 1.098, 1.099, 1.100, 1.101, 1.102, 1.103, 1.104, 1.105, 1.106, 1.107, 1.108, 1.109, 1.110, 1.111, 1.112, 1.113, 1.114, 1.115, 1.116, 1.117, 1.118, 1.119, 1.120, 1.121, 1.122, 1.123, 1.124, 1.126, 1.127, 1.128, 1.129, 1.130, 1.131, 1.132, 1.133, 1.134, 1.135, 1.136, 1.137, 1.138, 1.139, 1.140, 1.141, 1.142, 1.143, 1.144, 1.145, 1.146, 1.147, 1.148, 1.149, 1.150, 1.151, 1.152, 1.153, 1.154, 1.155, 1.156, 1.157, 1.158, 2.001, 2.002, 2.003, 2.004, 2.005, 2.006, 2.007, 2.008, 2.009, 2.010, 2.011, 2.012, 2.013, 2.014, 2.015, 2.016, 2.017, 2.018, 2.019, 2.020, 2.021, 2.022, 2.023, 2.024, 2.025, 2.026, 2.027, 2.028, 2.029, 2.030, 2.031, 2.032, 2.033, 2.034, 2.035, 2.036, 2.037, 2.038, 2.039, 2.040, 2.041, 2.042, 2.043, 2.044, 2.045, 2.046, 2.047, 2.048, 2.049, 2.051, 2.052, 2.053, 2.054, 2.055, 2.056, 2.057, 2.058, 2.059, 2.060, 2.061, 2.062, 2.063, 2.064, 2.065, 2.066, 2.067, 2.068, 2.069, 2.070, 2.071, 2.072, 2.073, 2.074, 2.075, 2.076, 2.077, 2.078, 2.079, 2.081, 3.001, 3.002, 3.003, 3.004, 3.005, 3.006, 3.007, 3.008, 3.009, 3.010, 3.011 및 3.012

80%

(57)

1.

I, E/Z, E/Z /



I,

R₁ C₁-C₁₂, C₃-C₈ C₂-C₁₂ ;

R₂ H, C₁-C₁₂ ;

R₃ C₂-C₁₂, C₁-C₁₂, C₃-C₁₂, C₂-C₁₂, C₁-C₆, -C₁-C₆, C₂-C₁₂ ;

R₂ R₃ CH₂ O, S NR₄ 3 7 4 7

-C₁-C₂, CN, SCN, NO₂, C₂-C₆ 1 3 OH, C₃-C₈ ; C₃-C₈ ; C₁-C₁₂, C₃-C₈ ; C₁-C₁₂

- 2 3. , .
- 4. / , 2
- 2 5. , 1 | .
- 6. , 2 .
- 3 7. , ,
- 7 8. .