(73)

　　　　　　　　　　　- 65926

(72)

　　　　　　　　　　　　　　　- 6239　　　　/　　　　　　　1- 3

　　　　　　　　　　　　　　　- 5416　　　　　　　　17

　　　　　　　　　　　　　　　- 6450　　　　　　　　53

　　　　　　　　　　　　　　　- 6093　　　　　　　　　　22

　　　　　　　　　　　　　　　- 6239　　　/　　　　　26

(74)

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(54)　　　(　　)　　　　　,　　　　　,　　　　　,

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EP- A- 31 938   ,

.   EP- A- 170 906   ,   EP- A- 154 153

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EP- A- 112 799   2- [4- (3,5-   - 2-   )   ]

4-   -   4-   - 2-   .

EP- A- 293 062

,   EP- A- 88 066   ,   3,5-   (

)   .
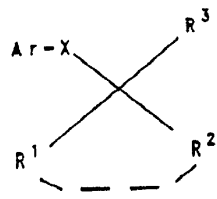
EP- A- 86 750   - 8-

- 8-   . EP- A- 94 349

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DE 2637886   ,

3-   .

(I)   ,

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I)   ;

(I)

,

R^1 R^2

$$\underset{\text{-C - R}}{\overset{\overset{\text{O}}{\|}}{}} \qquad \underset{\text{-C - R}}{\overset{\overset{\text{S}}{\|}}{}} \qquad \text{-CN}$$

$$\underset{\underset{\text{Z-R}^5}{|}}{\overset{\overset{\text{Y-R}^4}{|}}{\text{-C - R}}} \qquad \underset{\underset{\text{T}}{\|}}{\overset{\overset{\text{NR}^6}{\|}}{\text{-C - R}}} \qquad \underset{}{\overset{\overset{\text{T}}{\|}}{\text{-C - Q -(A}_i\text{X}_i)_q\text{ - R}}}$$

또는 $\underset{}{\overset{\overset{\text{T}}{\|}}{\text{-C·Q-R}^T}}$,

[, R, R^T, R^4, R^5, R^6, Y, T, Z, Q, A $_i$, X_i q   ]   ,
        - CO- Q^1 - D- Q^2 - CO- [, Q^1 Q^2 Q   ,
D $CR'R''$ $C= O($, R'   R'' C_1- C_4-   ) 2
  ]   ,

R^3 ,   , C_1- C_{18} -   , C_2- C_8-   , C_2- C_8-   , C_1- C_{18} -   , C_2- C_8-   , C_2
- C_8-   , C_1- C_{18} -   , C_2- C_8-   , C_2- C_8-   [9
                  ]
          ]   ; C_1- C_4-   ,   ,
                C_3- C_{12} -   ; $SiR^aR^bR^c$ [, R^a, R^b R^c C_1
- C_4-   , C_2- C_4-   , C_2- C_4-   ]   ,   Ar' X' - [
      Ar'   X'   Ar   X   ]   ,

X   O, S, NH- NH NR^d [, R^d R^4]   ;   - CH_2O- , - CH_2S- , - CH(A
r) O-   - CH(Ar) S-   ,

Ar   ,   ,   ,
                            ,

또는

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(U)   ,

- 3 -

, , , , , C_1-C_8- , C_1-C_8- , C_1-C_8- , C_1-C_8- ,
-(C_1-C_4-) , -(C_1-C_4-) , C_1-C_9- C_1-C_8- ,
8 , , C_1-C_8- , , , ,
3 CH_2 C_1-C_8- , C_1-C_8- , C_1-C_6-
, C_1-C_6- , C_2-C_8- , C_2-C_8- , C_2-C_8- , C_2-C_8-
, C_3-C_7- , C_3-C_7- , - - (C_1-C_4-) C_1-C_8- ,
, , C_1-C_6- (:), C_1-C_6- (;),
C_1-C_6- , C_1-C_6- , C_1-C_6- , C_1-C_6- , , , (C_1-C_2-) ,
-(C_1-C_2-) , 3
,

0 1 5, 1 3 ,

p 1 7, 1 3], Ar , , , , , ,
, , ,
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R , 1 30 , ,
, , R , C_1-C_{18}- , C_3-C_{12}-
, C_2-C_8- , C_2-C_8- , , C-
, , , , , C_1-C_8- (
), C_1-C_8- , C_1-C_8- , C_2-C_8- , C_2-C_8- , C_1-C_8- , C_1-
C_8- , C_2-C_8- , C_2-C_8- , C_3-C_7- , C_3-C_7- , -
NR^*R^{**} , - CO- NR^*R^{**} - O- CO- NR^*R^{**} (,
R^* R^{**} , C_1-C_8- , C_2-C_8- , C_2-C_8- , ,
, N, O S 2
C_1-C_4- 3 8),(C_1-C_8-) ,
(C_1-C_8-) , (C_2-C_8-) , (C_1-C_8-) , (C_2-C_8-)
, (C_2-C_8-) , (C_2-C_8-) , , (C_1-C_8-) , (C_2-C_8-)
, (C_2-C_8-) , C_1-C_4- , C_1-C_4- , (C_1-C_8-) , (C_2-
C_8-) , (C_2-C_8-) , (C_1-C_8-) , (C_2-C_8-)
, (C_2-C_8-) , (C_1-C_8-) ; , NO_2, C
$_1$-C_4- (C_1-C_6-) ; (C_2-C_6-)
, (C_2-C_6-) , (C_1-C_8-) , (C_2-C_8-) , (C_2-C_8-
) , C_1-C_8- , , - C_1-C_6- , -(C_1-C_6-) , ,
- C_1-C_6- , -(C_1-C_6-) , , , , -(C_1-
C_6-) -(C_1-C_6-) , (11
, C_1-C_4- , C_1-C_4- , C_1-C_4- , C_1-C_4- , C_1-C_4-
), - SiR'_3, - O- SiR'_3, $(R')_3$
Si- C_1-C_6- , CO- O- NR'_2, - O- N= CR'_2, - N= CR'_2, - O- NR'_2, - $CH(OR')_2$ - O- (CH_2), - CH(OR')
$_2$(, R' , C_1-C_4- , , C_1-C_4- , C_1-C_4- , C_1-C_4-
, C_1-C_4-
, 2 C_2-C_6- , m O 6) , R" O- CHR" ' CH(O
R")- C_1-C_6- (R" C_1-C_4- , C_1-C_6 , R" '
C_1-C_4-)
, .

R^T - CO- R, - CS- R, - NR^{1}R^1, - N= CR^{b}R^1 SiR^{a}R^{b}R^c (, R , R^i R ^{a}, R^b R^i , C$_1$- C$_4$- , C$_2$- C$_4$- , C$_2$- C$_4$- , , , R^i R^a N, O S 2 C$_1$- C$_4$- 5- 6- , R^a, R^b R^c C$_1$- C$_4$- , C$_2$- C$_4$- , C$_2$- C$_4$- ,) ,

Y Z , , S, SO SO$_2$, - NR^c (, R^c R^4) ,

R^4 R^5 , , C$_1$- C$_6$- , C$_2$- C$_6$- , C$_2$- C$_6$- , (C$_1$- C$_6$-) [4 , C$_1$- C$_8$- , , , , C$_1$- C$_8$- , CH$_2$, 3 C$_1$- C$_6$- , C$_1$- C$_8$- , C$_1$- C$_6$- , C$_2$- C$_8$- , C$_2$- C$_8$- , C$_2$- C$_8$- , C$_2$- C$_8$- , C$_3$- C$_7$- , C$_3$- C$_7$- , , - - (C$_1$- C$_4$-)], , SiR^{a}R^{b}R^c (, R^a, R^b R ^{c} C$_1$- C$_4$- , C$_2$- C$_4$- , C$_2$- C$_4$-) , C$_3$- C$_8$- , C$_3$- C$_8$- , 3 7 , , [, 6 C$_1$- C$_8$- , , C$_1$- C$_8$- , , , , C$_1$- C$_8$- , - CH , 3 C$_1$- C$_8$- , C$_1$- C$_8$- , C$_1$- C$_6$- , C$_2$- C$_8$- , C$_2$- C$_8$- , C$_2$ - C$_8$- , C$_2$- C$_8$- , C$_3$- C$_7$- , C$_3$- C$_7$- , - (C $_1$- C$_4$- ( )] ,

R^4 R^5 C$_2$- C$_4$- , , , , 1 2 C$_2$- C$_4$- ,

R^6 , C$_1$- C$_4$- , C$_2$- C$_4$- , C$_2$- C$_4$- , C$_6$- C$_{12}$- , , , C$_1$- C$_4$- , ((C$_1$- C$_4$-)), , - NH- CO- NH$_2$, - NH- CS- NH$_2$, - - (C$_1$- C$_4$-) , - NH- , - NHSO$_2$- (C$_1$- C$_4$-), C$_6$- C$_{12}$- , , NH- SO$_2$- NH- , 4 , , (C$_1$- C$_4$)- , (C$_1$- C$_4$)- , (C$_1$- C$_4$)- (C$_1$- C$_4$)- ,

T O, S, NR^7, NOR^7 NO- ,

Q O S ,

q 0 4 ,

i q 0 l q ,

X$_I$ O, S, NR^7 N- (A$_i$- X$_i$-)$_q$- R ,

A$_I$ C$_1$- C$_6$- , C$_2$- C$_6$- , C$_2$- C$_6$- , C$_3$- C$_6$- , C$_3$- C$_6$- , , ,

R^7 H, C$_1$- C$_4$- , C$_2$- C$_4$- , C$_2$- C$_4$- , C$_3$- C$_6$- , C$_3$- C$_6$- , , .

(1)

1   4

2   4

: n-   , i-   1,3-   ),   (: n-   , 1-   1,4-   )   ;

, 1-   - 2-   - 1
- , 2-   - 2- - 1- ,   - 2- - 1- ,   - 3- - 1- , 1-   -   - 3- - 1-   1-
-    - 2- - 1-   ;   ,   - 2- - l- ,   - 3- - 1- , 1-   -   - 3-
- 1-   .

CF$_3$, CHF$_2$, CH$_2$F, CF$_3$CF$_2$, CH$_2$FCHCl, CCl$_3$, CHCl$_2$ CH$_2$CH$_2$Cl   ;   O
CF$_3$, OCHF$_2$, OCH$_2$F, CF$_3$CF$_2$O   OCH$_2$CF$_3$.

;

l,2   3   1   4 ,   1   2

(:   ), C$_1$- C$_4$-   (   ), C$_1$- C$_4$-   (
), C$_1$- C$_4$-   (   ), C$_1$- C$_4$-   ,

, (C$_1$- C$_4$)-   , (C$_1$- C$_4$)-   , (C$_1$- C$_4$)-   , (C$_1$- C$_4$)
-
,   O- , m-   p-   ,   , 2- , 3-   4-
, 2- , 3-   4-   - -   , 2,4- , 3,5- , 2,5-   2,3-   ,   o- , m-   p-

3   7   CH   N   /
2   CH   NH, S   /   O   ,   .
-

,   (: (C$_1$- C$_4$-   )   ),

(I)   (I)
.   ,   ,   , E-   Z-   ,
(1)   .

(1)   R   1
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(:   ),   (:   )   .

1 , 2   3
(,   ,   ,   , 4   ,   ,
,   ,   , - N-   ,   ,   ,   ,   ,   ,
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)   .

4 C_1- C_6-
,   ,   ,
,   - 2-   .

,   ,
-        $(C_1$- $C_6)$-   -   ,   ,
,   , - (2-   )   - (2-   )
.

R^3 , C_1- C_4-   , C_1- C_4-   , C_5- C_6-   ,   ,   Ar'X'-
(, Ar'   X'   Ar   X   )   ,

X   O, S, NH, NCH$_3$ NC$_2$H$_5$,

Ar   ,

(U)$_o$ (U)$_p$

[,

(U)   ,

,   (:   ,   ,   ),   ,   , C_1- C_4-   , C_1- C_4-   ,
C_1- C_4-   , C_1- C_4-   ,   - $(C_1$- C_4-   )   ,   - $(C_1$- C_4-   )   , C_1- C_4-   C$_1$- C_4-   ,

o   1   3   ,

p   1   3   ],

Ar   ,   ,   ,   ,   ,   ,   ,   ,   ,
                                                                    ,   1   3
              U

    (I)   .

      ,

R   , C_1- C_8-   , C_4- C_7-   , C_2- C_8-   , C_2- C_8-   ,   ,
            ,   7   ,   ,   ,   ,   ,
C_1- C_4-   (   ), C_1- C_4-   , C_1- C_4-   , C_2- C_4-   , C_2- C_4-
      , C_1- C_4-   , C_1- C_4-   , C_2- C_4-   , C_2- C_4-   , C_5- C_6-   , C
$_5$- C_6-   ,   ,   - (C_1- C_4-   )   , (C_1- C_6-   )   ,   - SiR'_3, - O-
NR'_2- , - O- N= CR'_2, - N= CR'_2 (, R'   , C_1- C_2-   ,
          C_2- C_5-   )

            (I)   , R^T - CO- R, - NR^1R   - N= CR^bR^i (, R, R
^{i}, R^a, R^b R^i)   .

R   , C_1- C_8-   , C_5- C_6-   , C_2- C_8- C_2- C_8-   ,   ,
                    4   ,   ,   , C_1- C_4-   , C_2- C_4-
      , C_2- C_4-   , C_5- C_6-   , C_5- C_6-   ,   -   - (C_1- C_4-   )   ,
      - SiR'_3, - O- N= CR'_2, - N= CR'_2 (R'   , C_1- C_2-
          C_2- C_5-   )
      .

R^T - CO- R(, R   )   - NR^iR - N= CR^bR^i , R'   R'
                  H, C_1- C_2-   ,   ,   - 1-   ,   - 1-   ,
    - 4-   ,   - 1-   - 1-   , R^b R^i H, C_1- C_2-   ,
      .

R^4 R^5 ,   , C_1- C_4-   , C_2- C_4-   , C_2- C_4-   , C_5- C_6-
                    C_5- C_6-

          (I)   ,

R^6 , C_1- C_4-   ,   ,   ,   , NH- CO- NH_2, - NH- C_1- C_4-   .

T   O, S NR^7,   O NR^7 ,

Q   O   S,   0   ,

– 8 –

q 0 4 ,

i q 0 , 1 q ,

X_i O, S, NR^7 N- $(A_i$- X_i- $)_q$- R ,

A_i, C_1- C_4- , C_2- C_4- C_5- C_6- ,
C_1- C_4- ,

R^7 H, C_1- C_4- , C_2- C_4- , C_2- C_4- C_5- C_6-
(I) .

R^1 R^2

$$\overset{O}{\underset{}{-C}-R}, \quad \overset{O}{\underset{}{-C}}-Q-(A_iX_i)_q-R \qquad CN(\qquad, R, T, Q, A_i, X_i \quad q$$

) (I) .

(I) , ,
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, .

(I)
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(I) , 2- (- 8- -) 2- (- 8-)
(G. Buchmann, J. prakt. Chem. 1965, 141); 4- (J. lzv. Sibirsk.
Ord. Akad. Nauk. SSSR 1962(11), 145- 8, : [Chem. Abstracts 59: 5051g(1963)]) . ,
.

(I) .

(1) ; , EP- A- 4433; J. Am. Chem.
Soc. 62 (1990) 1154; J. Org. Chem. 36(1971) 3646; Chem. Abstr. 111(1988) 133625q; EP- A- 326328; J.
Am. Chem. Soc. 94(1972) 712; Ukr. Khim. Zh. (Russ. Ed.) 56(1990) 638; Chem. Abstr. 114(l991) 42155
g; Chem. Pharm. Bull. 17(1969) 419; Chem. Lett. 1973, 287; J. Chem. Soc. Chem. Comm. 1979, 50; Bull.
Chem. Soc. Jpn. 45(1972) 866; J. Org. Chem. 39(1974) 1233 .

, (1)

(a) Ar- X- H(, Ar X (I)) (II)
,

(b) Ar- W (III) ,

(c)   AR- X- W   (IV)   ,

(d)   (V)   -

.
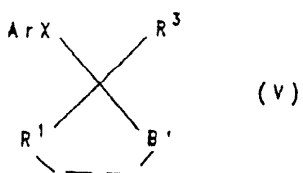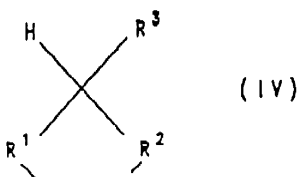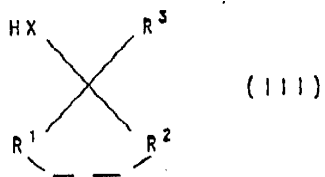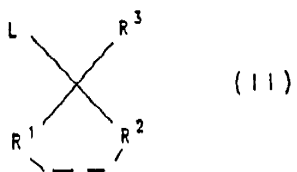
(II)

L   ,   ,   ,   ,

R^1, R^2 R^3 (I)   ,

(III)   ,

W   ,   ,   ,   ,

Ar, X, R^1, R^2 R^3 (I)   ,

(IV)   ,

W   ,   ,   ,   ,   ,   ,

Ar, X, R ^{1}, R ^{2} R ^{3} (I)   ,

(V)   ,

Ar, X, R ^{1} R ^{3} (I)   ,

B ' $\overset{T}{\underset{\|}{C}}-Q(A_iX_i)_q-R$ $\overset{\text{또는}}{\underset{\|}{C}}\overset{T}{OR^T}$, R ^{1} B '   ,   - CO- Q ^{1}- D- Q ^{2}- C O-   ,
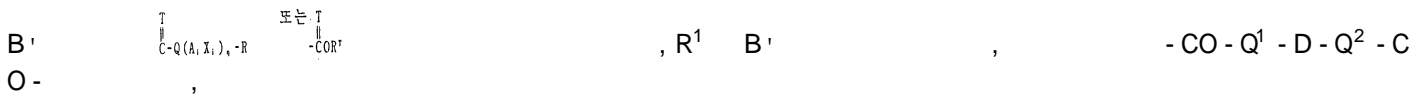
T, Q, A $_1$, X $_1$, q, R, R ^{T}, Q ^{1}, Q ^{2} D   (l)   .

(a)   ,   40   180   ,   ,   (:   )
,   , N,N-   ,   ,
.

(b)   ,   40   180   ,   ,   (:   )
,   , N,N-   ,   ,   ,
.

(c)   ,   20   100   ,   ,   (:
)   (, N,N-
,   ,   )   (,   )
.

(d)   ,   ,
,   (V)   .

(I)
,   ,   .

(I)   ,
.

.   (I)
,   ,   ,   ,
- ,   -   (:   - ,
- ,   - ,   -   ),
,   ,   ,   ,
S- (N-   - N-   )   .   -
,   .

, :

(A) (C$_1$- C$_4$)- , (C$_2$- C$_4$)- (C$_3$- C$_4$)- - -

,

(Al) - ,

2- (4- (2,4-))

(-),

2- (4- (4- - 2-))

(: DE- A- 2601548),

2- (4- (4- - 2-))

(: US- A- 4808750),

2(4- (2- - 4-))

(: DE- A- 2433067),

2- (4- (2- - 4-))

(: US- A- 4808750),

2- (4- (2,4-))

(:DE- A- 2417487),

4- (4- (4-)) - 2- ,

2- (4- (4-))

(: DE- A- 2433067),

(A2) " " ,

,

2- (4- (3,5- - 2-))

(: EP- A- 2925),

2- (4- (3,5- - 2-))

(: EP- A- 3114),

2- (4- (3- - 5- - 2-))

(: EP- A- 3890),

2- (4- (3-   - 5-   - 2-   )   )

(: EP- A- 3890),

2- (4- (5-   - 3-   - 2-   )   )-

(EP- A- l91736),

2- (4- (5-   - 2-   )   )-

(-   ),

(A3) "   "   ,   ,

2- (4- (6-   - 2-   )   )-

(-   -   ),

2- (4- (6-   - 2-   )   )

(:   [J. pest. Sci. Vol. 10, 6l(1985)),

2- (4- (6-   - 2-   )   )   2-

(

),

2- (4- (6-   - 2-   -   )   )

(-   ),   D(+)   (- P-   ),

2- (4- (6-   - 2-   -   )   )

(: DE- A- 2640730),.

- 2-   -   2- (4- (6-   )-

(: EP- A- 323 727),

(B)   ,   -

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(BI)   -   ,

1- (2-   )- 3- (4-   - 6-   - 1,3,5-   -

2-   )   (   ),

1- (2-   )- 3- (4-   - 6-   )-

2-   )   (-   ),

1- (2-   )- 3- (4-   - 6-   - 1,3,5-   - 2-   )

(-   ),

1- (2-   )- 3- (4-   - 6-   - 1,3,5-

- 2-   )   (   ),

1- (2-   )- 3- (4,6-   - 2-   )

(-   ),

1- (2-   )- 3- (4-   - 6-   - 1,3,5-

- 2-   )- 3-   (-   ),

1- (2-   )- 3- (4,6-   - 2-   )

(-   ,

1- (2-   )- 3- (4,6-   (   )-

- 2-   )   (-   ),

3- (4-   - 6-   - 1,3,5-   - 2-   )- 1- (2,3-   -

1,1-   - 2-   [b]   - 7-   )   (: EP- A- 79683),

3- (4-   - 6-   - 1,3,5-   - 2-   )- 1- (2,3-   -

1,1-   - 2-   [b]   - 7-   )   (: EP- A- 79683),

(B2)   ,   1- (2-   - 3-   )-

3- (4-   - 6-   - 1,3,5-   - 2-   )   (-   ),

(B3)   ,

1- (4-   - 1-   - 5-   )- 3- (4,6-

        - 2-   )   (-   ),

      3-   - 5- (4,6-   - 2-   )-

1-   - 4-   (: EP 282613),

      5- (4,6-   - 2-   )- 1- (2-   )

        - 4-   (NC- 330,   :   [Brighton Crop Prot.

Conference- Weeds- 1991, Vol. l, 45ff.]),

(B4)   ,

3- (4,6-   - 2-   )- 1- (N-   - N-

)   (   )   (: EP- A- 0131258

        [Z, Pfl. Krankh. Pfl. Schutz 1990, Special issue XII, 489- 497),

(B5)   ,

1- (3- N,N-   - 2-   )- 3- (4,6-

        - 2-   )   (   ),

1- (3-   - 2-   )- 3- (4,6-   -

2-   )   (DPX- E 9636,   :   [Brighton Crop Prot. Conf.

- Weeds- 1989, pp. 23ff]),

DE- A- 4000503   DE- A- 4030577

,

$$R^{12}- \underset{\underset{O}{\overset{O}{\parallel}}{\underset{\parallel}{\overset{R^{11}}{\big|}}}}{\underset{N}{\bigcirc}}{\overset{R^{11}}{\big|}}- S\overset{O}{\underset{O}{\parallel}}_2- NH- \underset{O}{\overset{O}{\parallel}}C- \underset{N}{\overset{R^{13}}{\big|}}- \underset{N}{\overset{N}{\bigcirc}}\overset{R^{14}}{\underset{E}{}}R^{15}$$

[,
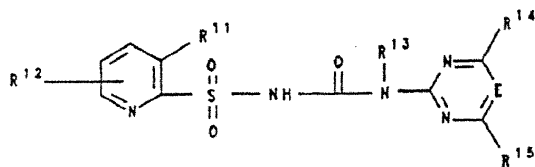
E   CH   N,   CH   ,

R^{11} $NR^{16}R^{17}$,

R^{12} H,   ,   , $C_1- C_3-$, $C_1- C_3-$,

$C_1- C_3-$, $C_1- C_3-$, $C_1- C_3-$,

$(C_1- C_3-\quad)- C_1- C_3-$, $(C_1- C_3-\quad)$,

      -          $(C_1- C_3-\quad)$, $C_1- C_3-$

-            , $SO_2- NR^aR^b$ $CO- NR^aR^b$ H   ,

R^a R^b H, $C_1- C_3-$,

$C_1- C_3-$, $C_1- C_3-$, $- (CH_2)_4-$, $- (CH_2)5-$

    $- (CH_2)_2- O- (CH_2)2-$,

R^{13} H CH_3 ,

R^{14} , $C_1- C_2-$, $C_1- C_2-$, $C_1- C_2-$

(CF_3), $C_1- C_2-$ (

$OCHF_2$ OCH_2CF_3)   ,

R^{15} $C_1- C_2-$, $C_1- C_2-$ ($OCHF_2$)

    $C_1- C_2-$,

R^{16} $C_1- C_4-$,

R^{17} $C_1- C_4-$,

R^{16} R^{17} $- (CH_2)_3SO_2-$ $- (CH_2)_4SO_2-$],

, 3- (4,6-   - 2-) - 1- (3- N-   - N-

      - 2-)   ,   ,

(B6) EP- A- 0342569   ,

[,
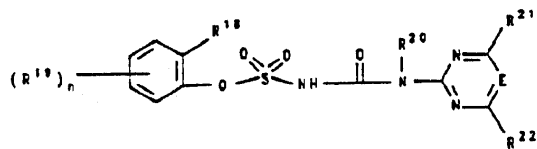
E   CH   N,   CH   ,

R^{18} ,   ,

R^{19} , NO_2, CF_3, CN, C_1- C_4-   , C_1- C_4-

   , C_1- C_4-   (C_1- C_3-   )

   ,   6-   ,

n   1,2   3,   1   ,

R^{20} , C_1- C_4- C_3- C_4-   ,

R^{21} R^{22} , C_1- C_2-   , C_1- C_2-

   , C_1- C_2-   , C_1- C_2-   (C_1- C_2-

) - C_1- C_2-   , OCH_3 CH_3]

    3- (4,6-   - 2-) - 1- (2-   )

      ,   ,

      ,   ,

(C)

N-   - 2,6-   (   ),

N- (3'-   - 2'-) - 2-   - 6-

(   ),

2',6'‑   ‑ N‑ (3‑   ‑ 1,2,4‑   ‑ 5‑   )‑

N‑ (2,6‑   )‑ N‑ (1‑   )

(   ),

(D)   ,

S‑   N,N‑   (EPTC)

S‑   N,N‑   (   ),

(E)   ,

    3‑ (1‑   )‑ 4‑   ‑ 6,6‑   ‑ 2‑

            ‑ 3‑   (   ),

2‑ (1‑   )‑ 5‑ (2‑   )‑ 3‑   ‑

            ‑ 2‑   ‑ 1‑   (   ),

2‑ (1‑   )‑ 5‑ (2‑   )‑ 3‑   ‑

            ‑ 2‑   ‑ 1‑   (   ),

2‑ (1‑ (3‑   )   )‑ 5‑ [2‑ (   )   ]‑ 3‑

                        ‑ 2‑   ‑ 1‑   ,

2‑ (1‑ (3‑   )   )‑ 5‑ [2‑ (   )   ]‑ 3‑

                    ‑ 2‑   ‑ 1‑   (   ),

2‑ (1‑   )   )‑ 3‑   ‑ 5‑ (‑ 3‑   )

    ‑ 2‑   (   )

2‑ (1‑   )‑ 5‑ (2,4,6‑   )‑ 3‑

            ‑ 2‑   ‑ l‑   (   ),

(F) 2‑ (4‑   ‑ 5‑   ‑ 2‑   ‑ 2‑   )

2‑ (4‑   ‑ 5‑   ‑   ‑ 2‑   )   ,

        ,

2- (4-   - 4-   - 5-   - 2-   - 2-   )- 5-

2- (4-   - 4-   - 5-   - 2-   - 2-   )- 4-

(   ),

5-   - 2- (4-   - 4-   - 5-   - 2-   - 2-   )-

      - 3-   (   ),

2- (4-   - 4-   - 5-   - 2-   - 2-   )-   - 3-

          (   ),

2- (4-   - 4-   - 5-   - 2-   - 2-   )-   - 3-

          (   ),

5-   - 2- (4-   - 4-   - 5-   - 2-   - 2-   )-

      - 3-   (   ),

(G)   ,

N- (2,6-   )- 7-   - 1,2,4-   - (1,5- c)-

          - 2-   (   ),

N- (2,6-   - 3-   )- 5,7-   - 1,2,4-   -

(1,5- c)-   - 2-   ,

N- (2,6-   )- 7-   - 5-   - 1,2,4-   -

(1,5- c)-   - 2-   ,

N- (2,6-   - 3-   )- 7-   - 5-   - 1,2,4-

          - (1,5- c)-   - 2-   ,

N- (2-   - 6-   )- 5,7-   - 1,2,4-   -

(1,5- c)-   - 2-   (:   EP- A- 343 752

   US- 4 988 812),

(H)   ,

2- (2-　　　- 4-　　　　　　　　) 　　　　　　- 1,3-　　(SC- 0051,

　　: EP- A- 137963),

2- (2-　　　　　)- 4,4-　　　　　　　　- 1,3-　 (　 :

EP- A- 274634),

2- (2-　　- 3-　　　　　　)- 4,4-　　　　　　　- 1,3-

　　(　 : WO- 91/13548),

(J)

　　　　　　,

　　3- (4,6-　　　　　- 2-　)　　　- 2-

(EP- A- 249 7O7),

　　3- (4,6-　　　　　- 2-　)　　- 2-

(EP- A- 249 7O7),

2,6-　　[(4,6-　　　　　- 2-　)　]　　(EP- A- 321 846),

1-　　　　　　　2,6-　[(4,6-　　　　　- 2-　)

　　]-　　　　(EP- A- 472 113),

(K) S- (N-　　- N-　　　　　)　　　　　,

　　　,

S- [N- (4-　　　)- N-　　　　　　]O,O-

　　　　　 (　　　).

　　A　　K

　　　　　　　　　　, 　　　　　　[" The Pesticide Manual", British Crop Protect ion Cou
ncil, 9th Edition, 1991, 　　8th Edition, 1987] 　　[" Agricultural Chemicals Book II, Herbicides", by W.
T. Thompson, Thompson Publications, Fresno Ca, USA, 1990] 　　[" Farm Chemicals Handbook '90, Meis
ter publishing Company, Willoughby, Oh, USA, 1990] 　　　　　　. 　　　　　　[Weed Techn.
1991, Vol. 5, 430- 438] 　　　.

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0.001 5kg, 0.005 0.5kg .

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(I) , / -

. , : (WP),

(EC), (SP), (SL), (EW)(,

), , (CS), (SC), , ,

(DP), - (OL), , (GR), , ,

, (SG), (WG), ULV , .

, , [Winnacker- Kuchler, " Chemische Tech
nologie" [Chermical Technology], Volume 7, C, Hauser Verlag, Munich, 4th Edn., 1986; Wade van Valkenb
urg, " Pesticide Formulations" , Marcel Dekker, N. Y., 1973; N. Y., 1973; K. Martens, " Spray Drying Han
dbook" , 3rd Ed. 1979, G. Goodwin Ltd. London] .

, , , , [Watk
ins, " Handbook of lnsecticide Dust Diluents and Carriers" , 2nd Ed., Darland Books, Caldwell N.j.; H. v. O
lphen, " Introduction to Clay Colloid Chemistry" , 2nd Ed., J. Wiley & Sons, N.Y.; Marsden, " Solvents Gu
ide" , 2nd Ed., lnterscience, N.Y. 1963; McCutcheon's, " Detergents and Emulsifiers Annual" , MC Publ. C

orp., Ridgewood N.J.; Sisley and Wood, " Encyclopedia of Surface Active Agents" , Chem. Publ. Co. lcn., H. Y. 1964; Schonfeldt, Grenzflachenaktive Athylenoxidaddukte " [Surface- active Ethylene Oxide Adducts], Wiss. Verlagsgesell., Stuttgart 1976; Winnacker- Kuchler, " Chemische Technologie" [Chemical Technolo gy], Volume 7, C. Hauser Verlag Munich, 4th Edn., 1986]   .

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,   (ready mix)   .

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                         ,   ,
,   ,   ,   2,2-   - 6,6' -   ,
                                                                                          .

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              (   ),   ,   ,
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              ,   0.1   99   %,   0.1   95   %   (1)   ( )
            /   , 1   99.9   %   5   99.8   %   , 0
25   %,   0.1   25   %   .

                        ,   ,   10   90   %   , 100   %
                    .   ,   1   80   %   .
    1   20   %   ,   0.2   20   %   .
-                              ,
          .   , -   10   90   %   .

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                                          .   ,
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A.

(a)   (I)   ,   (I)   10
     90   ,   (hammer mill)   .

(b)   (I)   ,   (I)   25   ,
          -            64   ,   10
          1   ,   (pin mill)
                    .

(c)   (I)   ,   (I)   20   ,
          (" Triton× 207) 6   ,   (8 EO) 3   (
     ,   255   277   ) 7l   ,   5μ
                    .

(d)   (I)   ,   (I)   15   ,
          75   10   .

(e)   ,   ,
                    -                              :

75   (I)   ,

     (I)

10   ,

5   ,

3   ,

7

(f)   ,   (bead mil1)   ,
          -   -   .

25   (I)   ,

     (I)

5   2,2'-   - 6,6'-

2   ,

1   ,

17

50

B.

1.   2-   (1   2) :

22.1g(160mmol)   30   , 100   7.5g(80mmol)
    ,   1   . 100   2-   15.5g(80mmol)
    ,   10   ,   ,   .   NaHC
O_3 NaCl   ,   ,   .
(,   /   2:1)   15.5g(77%)   2-
   .

2.   2- (3,4-   )- 3-   (1   38) :

13.0g(80mmol)   3,4-   12.2g(88mmol)   400   30   .
15.8g(96mmol)   2-   ,   8   ,
   ,   .   3   ,
   ,   .   15.8g(68%)   2- (3,4-   )- 3-
    .

    1   2   (I)   .

[1]
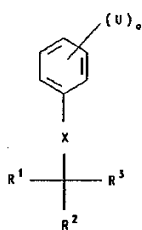
사용한 약어 : Bz = 벤질.

Ex.	X	$(U)_o$	R^1	R^2	R^3	m.p. [°C] (n_D^{30})
1	O	H	COOH	COO-H	.H	
2	O	H	COO-C_2H_5	COO-C_2H_5	H	(1.4902)
3	O	H	COO-C_2H_5	COO-CH(CH_3)(CH_2)$_4$$CH_3$	H	(1.4765)

Ex.	X	$(U)_o$	R^1	R^2	R^3	m.p. [°C] (n_D^{30})
4	O	H	$COO\text{-}CH(CH_3)(CH_2)_4CH_3$	$COO\text{-}CH(CH_3)(CH_2)_4CH_3$	H	(1.4700)
5	O	4-Cl	COOH	COOH	H	
6	O	4-Cl	$COO\text{-}C_2H_5$	$COO\text{-}C_2H_5$	H	(1.5000)
7	O	4-Cl	$COO\text{-}C_2H_5$	$COO\text{-}CH(CH_3)(CH_2)_4CH_3$	H	(1.4869)
8	O	4-Cl	$COO\text{-}CH(CH_3)(CH_2)_4CH_3$	$COO\text{-}CH(CH_3)(CH_2)_4CH_3$	H	(1.4790)
9	O	4-Cl	$COO\text{-}CH_2CH=CH_2$	$COO\text{-}CH_2CH=CH_2$	H	
10	O	4-Cl	$COO\text{-}C_4H_9$ (n)	$COO\text{-}C_4H_9$ (n)	H	
11	O	4-Cl	$COO\text{-}C_8H_{17}$ (i)	$COO\text{-}C_8H_{17}$ (i)	H	
12	O	4-Cl	COOH	COOH	CH_3	
13	O	4-Cl	$COO\text{-}C_2H_5$	$COO\text{-}C_2H_5$	CH_3	(1.4920)
14	O	4-Cl	$COO\text{-}C_2H_5$	$COO\text{-}C_2H_5$	Bz	

Ex.	X	$(U)_o$	R^1	R^2	R^3	m.p. [°C] (n_D^{30})
15	O	4-Cl	$COO\text{-}C_2H_5$	$CO\text{-}CH_3$	H	n_D^{21}: 1.5162
16	O	4-Cl	$COO\text{-}CH(CH_3)(CH_2)_4CH_3$	$CO\text{-}CH_3$	H	
17	O	4-Cl	$COO\text{-}C_2H_5$	$CO\text{-}CH_2\text{-}C_6H_5$	H	
18	O	4-Cl	$COO\text{-}C_2H_5$	$C(=NOH)\text{-}CH_3$	H	
19	O	4-Cl	$COO\text{-}C_2H_5$	$C(OC_2H_5)_2\text{-}CH_3$	H	
20	O	4-Cl	$CO\text{-}CH_3$	$CO\text{-}CH_3$	H	
21	O	4-Cl	$C(=NOH)\text{-}CH_3$	$C(=NOH)\text{-}CH_3$	H	
22	O	4-Cl	$COO\text{-}C_2H_5$	CN	H	
23	O	4-Cl	CN	CN	H	
24	O	$2,4\text{-}Cl_2$	COOH	COOH	H	
25	O	$2,4\text{-}Cl_2$	$COO\text{-}C_2H_5$	$COO\text{-}C_2H_5$	H	(1.5139)

Ex.	X	$(U)_o$	R^1	R^2	R^3	m.p. [°C] (n_D^{30})
26	O	$2,4\text{-}Cl_2$	$COO\text{-}C_2H_5$	$COO\text{-}CH(CH_3)(CH_2)_4CH_3$	H	(1.4931)
27	O	$2,4\text{-}Cl_2$	$COO\text{-}CH(CH_3)(CH_2)_4CH_3$	$COO\text{-}CH(CH_3)(CH_2)_4\text{-}CH_3$	H	(1.4837)
28	O	$2,4\text{-}Cl_2$	COOH	$CO\text{-}CH_3$	H	
29	O	$2,4\text{-}Cl_2$	$COO\text{-}C_2H_5$	$CO\text{-}CH_3$	H	
30	O	$2,4\text{-}Cl_2$	$COO\text{-}CH(CH_3)(CH_2)_4CH_3$	$CO\text{-}CH_3$	H	
31	O	$2,4\text{-}Cl_2$	COONa	$CO\text{-}CH_3$	H	
32	O	$2,4\text{-}Cl_2$	COOK	$CO\text{-}CH_3$	H	
33	O	$2,4\text{-}Cl_2$	$COO\text{-}C_2H_5$	CN	H	
34	O	$2,4\text{-}Cl_2$	CN	CN	H	
35	O	$2,4\text{-}Cl_2$	$CO\text{-}CH_3$	$CO\text{-}CH_3$	H	
36	O	$3,4\text{-}Cl_2$	COOH	COOH	H	

Ex.	X	$(U)_o$	R^1	R^2	R^3	m.p. [°C] (n_D^{30})
37	O	$3,4\text{-}Cl_2$	$COO\text{-}C_2H_5$	$COO\text{-}C_2H_5$	H	(1.5117)
38	O	$3,4\text{-}Cl_2$	$COO\text{-}C_2H_5$	$COO\text{-}CH(CH_3)(CH_2)_4CH_3$	H	(1.4950)
39	O	$3,4\text{-}Cl_2$	$COO\text{-}CH(CH_3)(CH_2)_4\text{-}CH_3$	$COO\text{-}CH(CH_3)(CH_2)_4\text{-}CH_3$	H	(1.4857)
40	O	$3,4\text{-}Cl_2$	$COO\text{-}C_2H_5$	$CO\text{-}CH_3$	H	n_D^{21}: 1.5131
41	O	$3,4\text{-}Cl_2$	$COO\text{-}CH(CH_3)(CH_2)_4\text{-}CH_3$	$CO\text{-}CH_3$	H	
42	O	$3,4\text{-}Cl_2$	$COO\text{-}C_2H_5$	$C(OC_2H_5)_2\text{-}CH_3$	H	
43	O	$3,4\text{-}Cl_2$	CN	CN	H	
44	O	$3,4\text{-}Cl_2$	CN	$COO\text{-}C_2H_5$	H	
45	O	$2\text{-}CH_3, 4\text{-}Cl$	COOH	COOH	H	
46	O	$2\text{-}CH_3, 4\text{-}Cl$	$COO\text{-}C_2H_5$	$COO\text{-}C_2H_5$	H	

Ex.	X	$(U)_0$	R^1	R^2	R^3	m.p. [°C] (n_D^{30})
47	O	2-CH₃, 4-Cl	COO-C₂H₅	COO-CH(CH₃)(CH₂)₄CH₃	H	
48	O	2-CH₃, 4-Cl	COO-CH(CH₃)(CH₂)₄-CH₃	COO-CH(CH₃)(CH₂)₄-CH₃	H	
49	O	2-CH₃, 4-Cl	COO-C₂H₅	CO-CH₃	H	
50	O	4-F	COO-C₂H₅	COO-C₂H₅	H	
51	O	4-F	COO-C₂H₅	COO-CH(CH₃)(CH₂)₄CH₃	H	
52	O	4-F	COO-CH(CH₃)(CH₂)₄-CH₃	COO-CH(CH₃)(CH₂)₄-CH₃	H	
53	O	4-F	COO-C₂H₅	CO-CH₃	H	
54	O	4-Br	COOH	COOH	H	
55	O	4-Br	COO-C₂H₅	COO-C₂H₅	H	(1.5160)
56	O	4-Br	COO-C₂H₅	COO-CH(CH₃)(CH₂)₄CH₃	H	(1.4969)

Ex.	X	$(U)_0$	R^1	R^2	R^3	m.p. [°C] (n_D^{30})
57	O	4-Br	COO-CH(CH₃)₂(CH₂)₄-CH₃	COO-CH(CH₃(CH₂)₄-CH₃	H	(1.4877)
58	O	4-Br	COO-C₂H₅	COO-C₂H₅	CH₃	
59	O	4-Br	COO-C₂H₅	CO-CH₃	H	(1.5321)
60	O	4-Br	COO-CH(CH₃)(CH₂)₄-CH₃	CO-CH₃	H	
61	O	4-Br	CO-CH₃	CO-CH₃	H	
62	O	4-Br	CN	COO-C₂H₅	H	
63	O	4-Br	CN	CN	H	
64	O	4-CH₃	COO-C₂H₅	COO-C₂H₅	H	
65	O	4-CH₃	COO-CH(CH₃)(CH₂)₄-CH₃	COO-CH(CH₃)(CH₂)₄-CH₃	H	
66	O	4-OC₂H₅	COO-C₂H₅	COO-C₂H₅	H	

Ex.	X	$(U)_o$	R^1	R^2	R^3	m.p. [°C] (n_D^{30})
67	O	4-OC$_2$H$_5$	COO-CH(CH$_3$)(CH$_2$)$_4$-CH$_3$	COO-CH(CH$_3$)(CH$_2$)$_4$-CH$_3$	H	
68	O	2-Cl, 4-CF$_3$	COOH	COOH	H	
69	O	2-Cl, 4-CF$_3$	COO-C$_2$H$_5$	COO-C$_2$H$_5$	H	
70	O	2-Cl, 4-CF$_3$	COO-C$_2$H$_5$	COO-CH(CH$_3$)(CH$_2$)$_4$-CH$_3$	H	
71	O	2-Cl, 4-CF$_3$	COO-CH(CH$_3$)(CH$_2$)$_4$-CH$_3$	COO-CH(CH$_3$)(CH$_2$)$_4$-CH$_3$	H	
72	O	2-Cl, 4-CF$_3$	COO-C$_2$H$_5$	CO-CH$_3$	H	
73	O	3-Br	COO-C$_2$H$_5$	COO-C$_2$H$_5$	H	
74	O	3-I	COO-C$_2$H$_5$	COO-C$_2$H$_5$	H	
75	O	2-F	COO-C$_2$H$_5$	COO-C$_2$H$_5$	H	

Ex.	X	$(U)_o$	R^1	R^2	R^3	m.p. [°C] (n_D^{30})
76	O	2-Cl	COO-C$_2$H$_5$	COO-C$_2$H$_5$	H	
77	O	2-Cl	COO-CH(CH$_3$)(CH$_2$)$_4$-CH$_3$	COO-CH(CH$_3$)(CH$_2$)$_4$-CH$_3$	H	
78	O	2-Cl	COO-C$_2$H$_5$	CO-CH$_3$	H	
79	O	4-NO$_2$	COO-C$_2$H$_5$	COO-C$_2$H$_5$	H	
80	O	2-NO$_2$	COO-C$_2$H$_5$	COO-C$_2$H$_5$	H	
81	O	2-NO$_2$, 4-Cl	COOH	COOH	H	
82	O	2-NO$_2$, 4-Cl	COO-C$_2$H$_5$	COO-C$_2$H$_5$	H	
83	O	2-NO$_2$, 4-Cl	COO-C$_2$H$_5$	COO-CH(CH$_3$)(CH$_2$)$_4$-CH$_3$	H	
84	O	2-NO$_2$, 4-Cl	COO-CH(CH$_3$)(CH$_2$)$_4$-CH$_3$	COO-CH(CH$_3$)(CH$_2$)$_4$-CH$_3$	H	

Ex.	X	$(U)_o$	R^1	R^2	R^3	m.p. [°C] (n_D^{30})
85	O	2-NO$_2$, 4-Cl	COO-C$_2$H$_5$	CO-CH$_3$	H	
86	O	2-NO$_2$, 4-Cl	COO-C$_2$H$_5$	C(NOH)-CH$_3$	H	
87	O	2-NO$_2$, 4-Cl	CN	CN	H	
88	O	2-NO$_2$, 4-Cl	COO-C$_2$H$_5$	CN	H	
89	O	2-NH$_2$, 4-Cl	COO-C$_2$H$_5$	COO-C$_2$H$_5$	H	
90	O	2-N(CH$_3$)$_2$, 4-Cl	COO-C$_2$H$_5$	COO-C$_2$H$_5$	H	
91	S	H	COO-C$_2$H$_5$	COO-C$_2$H$_5$	H	
92	S	4-Cl	COO-C$_2$H$_5$	COO-C$_2$H$_5$	H	b.p. (0.1) 140-145°
93	S	4-Cl	CN	CN	H	
94	S	4-Br	COO-C$_2$H$_5$	COO-C$_2$H$_5$	H	

Ex.	X	$(U)_o$	R^1	R^2	R^3	m.p. [°C] (n_D^{30})
95	S	2,5-Cl$_2$	COO-C$_2$H$_5$	COO-C$_2$H$_5$	H	
96	NH	4-Cl	COO-C$_2$H$_5$	COO-C$_2$H$_5$	H	94 - 95
97	NH	2,4-Cl$_2$	COO-C$_2$H$_5$	COO-C$_2$H$_5$	H	
98	NH	3-Cl	COO-C$_2$H$_5$	COO-C$_2$H$_5$	H	
99	NH	3,4-Cl$_2$	COO-C$_2$H$_5$	COO-C$_2$H$_5$	H	
100	NCH$_3$	4-Cl	COO-C$_2$H$_5$	COO-C$_2$H$_5$	H	
101	NCH(CH$_3$)$_2$	4-Cl	COO-C$_2$H$_5$	COO-C$_2$H$_5$	H	
102	NCH(CH$_3$)$_2$	4-Cl	COO-C$_2$H$_5$	COO-CH(CH$_3$)(CH$_2$)$_4$-CH$_3$	H	
103	NCH(CH$_3$)$_2$	4-Cl	COO-CH(CH$_3$)(CH$_2$)$_4$-CH$_3$	COO-CH(CH$_3$)(CH$_2$)$_4$-CH$_3$	H	
104	NH-NH	4-Cl	COO-C$_2$H$_5$	COO-C$_2$H$_5$	H	

Ex.	X	$(U)_o$	R^1	R^2	R^3	m.p. [°C] (n_D^{30})
105	NH-NH	3,4-Cl₂	COO-C₂H₅	COO-C₂H₅	H	
106	NH-NH	2,4-Cl₂	COO-C₂H₅	COO-C₂H₅	H	
107	NH-NH	4-Br	COO-C₂H₅	COO-C₂H₅	H	
108	O	3-Cl	COO-C₂H₅	CO-CH₃	H	
109	O	3-Cl	COO-C₂H₅	COO-C₂H₅	H	(1.5016)
110	O	3-Cl	COO-C₂H₅	COO-CH(CH₃)(CH₂)₄-CH₃	H	(1.4838)
111	O	3-Cl	COO-CH(CH₃)(CH₂)₄-CH₃	COO-CH(CH₃)(CH₂)₄-CH₃	H	(1.4779)
112	O	3-Cl	COO-C₂H₅	CN	H	
113	O	3-Cl	CN	CN	H	

Ex.	X	$(U)_o$	R^1	R^2	R^3	m.p. [°C] (n_D^{30})
114	O	[benzoxazole structure: 4-O-...-Cl]	COO-C₂H₅	COO-C₂H₅	H	수지
115	O	"	COOC₂H₅	COOC₂H₅	CH₃	오일
116	S	4-Cl	COOC₂H₅	COOC₂H₅	SC₆H₄-p-Cl	77 - 80

[2]

$$R^1 \underset{R^2}{\overset{\overset{\displaystyle Ar}{\overset{|}{X}}}{\underset{|}{\rule{1.5cm}{0.4pt}}}} R^3$$

사용한 약어 : Bz = 벤질

Ex.	Ar	X	R^1	R^2	R^3	m.p. [°C] (n_D^{30})
1	[pyridine, 2-substituted]	O	COOH	COOH	H	
2	"	O	COO-C₂H₅	COO-C₂H₅	H	
3	"	O	COO-CH(CH₃)(CH₂)₄-CH₃	COO-CH(CH₃)(CH₂)₄-CH₃	H	
4	"	O	COO-CH₂-CH=CH₂	COO-CH₂-CH=CH₂	H	

- 30 -

Ex.	Ar	X	R¹	R²	R³	m.p. [°C] (n_D^{30})
5	"	O	$COO\text{-}C_4H_9$ (n)	$COO\text{-}C_4H_9$ (n)	H	
6	"	O	$COO\text{-}C_8H_{17}$ (i)	$COO\text{-}C_8H_{17}$ (i)	H	
7	"	O	$COO\text{-}C_2H_5$	$COO\text{-}C_2H_5$	CH_3	
8	"	O	$COO\text{-}C_2H_5$	$CO\text{-}CH_3$	H	
9	"	O	$COO\text{-}CH(CH_3)(CH_2)_4\text{-}CH_3$	$CO\text{-}CH_3$	H	
10	"	O	CN	CN	H	
11	"	O	$COO\text{-}C_2H_5$	CN	H	
12		O	COOH	COOH	H	
13	"	O	$COO\text{-}C_2H_5$	$COO\text{-}C_2H_5$	H	

Ex.	Ar	X	R¹	R²	R³	m.p. [°C] (n_D^{30})
14	"	O	$COO\text{-}CH(CH_3)(CH_2)_4\text{-}CH_3$	$COO\text{-}CH(CH_3)(CH_2)_4\text{-}CH_3$	H	
15	"	O	$COO\text{-}C_2H_5$	$CO\text{-}CH_3$	H	
16	"	O	CN	CN	H	
17	"	O	$COO\text{-}C_2H_5$	CN	H	
18		O	COOH	COOH	H	147 (분 해)
19	"	O	$COO\text{-}C_2H_5$	$COO\text{-}C_2H_5$	H	(1.5370)
20	"	O	$COO\text{-}C_2H_5$	$COO\text{-}CH(CH_3)(CH_2)_4\text{-}CH_3$	H	(1.5205)
21	"	O	$COO\text{-}CH(CH_3)(CH_2)_4\text{-}CH_3$	$COO\text{-}CH(CH_3)(CH_2)_4\text{-}CH_3$	H	(1.5045)
22	"	O	$COO\text{-}CH_2\text{-}CH=CH_2$	$COO\text{-}CH_2\text{-}CH=CH_2$	H	

Ex.	Ar	X	R^1	R^2	R^3	m.p. [°C] (n$_D^{30}$)
23	"	O	COO-C$_2$H$_5$	CO-CH$_3$	H	n$_D^{21}$: 1.5570
24	"	O	COO-CH(CH$_3$)(CH$_2$)$_4$-CH$_3$	CO-CH$_3$	H	오일
25	"	O	COO-C$_2$H$_5$	CN	H	
26	"	O	CN	CN	H	
27		O	COOH	COOH	H	226
28	"	O	COO-C$_2$H$_5$	COO-C$_2$H$_5$	H	77-78
29	"	O	COO-C$_2$H$_5$	COO-CH(CH$_3$)(CH$_2$)$_4$-CH$_3$	H	
30	"	O	COO-CH(CH$_3$)(CH$_2$)$_4$-CH$_3$	COO-CH(CH$_3$)(CH$_2$)$_4$-CH$_3$	H	(1.5145)

Ex.	Ar	X	R^1	R^2	R^3	m.p. [°C] (n$_D^{30}$)
31	"	O	COO-CH$_2$-CH=CH$_2$	COO-CH$_2$-CH=CH$_2$	H	(1.5597)
32	"	O	COO-CH(CH$_3$)$_2$	COO-CH(CH$_3$)$_2$	H	(1.5344)
33	"	O	COO-C$_4$H$_9$ (n)	COO-C$_4$H$_9$ (n)	H	
34	"	O	COO-C$_2$H$_5$	COO-C$_4$H$_9$ (t)	H	
35	"	O	COO-C$_4$H$_9$ (t)	COO-C$_4$H$_9$ (t)	H	
36	"	O	COO-C$_8$H$_{17}$ (i)	COO-C$_8$H$_{17}$ (i)	H	
37	"	O	COO-C$_2$H$_5$	COO-C$_5$H$_9$ (c)	H	
38	"	O	COO-C$_5$H$_9$ (c)	COO-C$_5$H$_9$ (c)	H	(1.5519)
39	"	O	COO-CH$_2$C$_6$H$_5$	COO-CH$_2$C$_6$H$_5$	H	수지
40	"	O	COO-CH$_2$CH$_2$OH	COO-CH$_2$CH$_2$OH	H	
41	"	O	COO-CH$_2$CF$_3$	COO-CH$_2$CF$_3$	H	
42	"	O	COOH	COOH	CH$_3$	

Ex.	Ar	X	R¹	R²	R³	m.p. [°C] (n_D^{30})
43	"	O	COO-C$_2$H$_5$	COO-C$_2$H$_5$	CH$_3$	
44	"	O	COO-C$_2$H$_5$	COO-CH(CH$_3$)(CH$_2$)$_4$-CH$_3$	CH$_3$	
45	"	O	COO-CH(CH$_3$)(CH$_2$)$_4$-CH$_3$	COO-CH(CH$_3$)(CH$_2$)$_4$-CH$_3$	CH$_3$	
46	"	O	COOH	COOH	Bz	
47	"	O	COO-C$_2$H$_5$	COO-C$_2$H$_5$.	Bz	
48	"	O	COO-C$_2$H$_5$	COO-CH(CH$_3$)(CH$_2$)$_4$-CH$_3$	Bz	
49	"	O	COO-CH(CH$_3$)(CH$_2$)$_4$-CH$_3$	COO-CH(CH$_3$)(CH$_2$)$_4$-CH$_3$	Bz	
50	"	O	COO-C$_2$H$_5$	CO-CH$_3$.	H	n_D^{21}: 1.5700
51	"	O	COO-CH(CH$_3$)(CH$_2$)$_4$-CH$_3$	CO-CH$_3$	H	(1.5350)

Ex.	Ar	X	R¹	R²	R³	m.p. [°C] (n_D^{30})
52	"	O	COO-C$_2$H$_5$	C(NOH)-CH$_3$	H	
53	"	O	COO-C$_2$H$_5$	C(OC$_2$H$_5$)$_2$-CH$_3$	H	
54	"	O	COO-C$_2$H$_5$	CN	H	
55	"	O	CN	CN	H	
56	(quinoline structure with OCH$_3$ and CH$_3$ substituents)	O	COO-C$_2$H$_5$	COO-C$_2$H$_5$	H	오일
57	"	O	COO-C$_2$H$_5$	COO-CH(CH$_3$)(CH$_2$)$_4$-CH$_3$	H	수지
58	"	O	COO-CH(CH$_3$)(CH$_2$)$_4$-CH$_3$	COO-CH(CH$_3$)(CH$_2$)$_4$-CH$_3$	H	수지

Ex.	Ar	X	R¹	R²	R³	m.p. [°C] (n_D^{30})
59	quinoline (8-methyl)	O	$COO \cdot C_2H_5$	$COO \cdot C_2H_5$	H	(1.5508)
60	"	O	$COO-C_2H_5$	$CO-CH_3$	H	
61	2-chloro-4-methylpyrimidine	O	$COO-C_2H_5$	$COO-C_2H_5$	H	오일
62	2,5,6-trichloro-4-methylpyrimidine	O	$COO-C_2H_5$	$COO-C_2H_5$	H	오일

Ex.	Ar	X	R¹	R²	R³	m.p. [°C] (n_D^{30})
63	2,6-difluoro-4-methylpyrimidine	O	$COO-C_2H_5$	$COO-C_2H_5$	H	오일
64	2,6-dichloro-4-methylpyrimidine	O	$COO-C_2H_5$	$COO-C_2H_5$	H	오일

Ex.	Ar	X	R¹	R²	R³	m.p. [°C] (n_D^{30})
65	2,5-dichloro-4-methylpyrimidine	O	$COO-C_2H_5$	$COO-C_2H_5$	H	(1.5078)
66	dichloro-methyl-triazine	O	$COO-C_2H_5$	$COO-C_2H_5$	H	(1.4890)
67	quinoline (8-methyl)	S	$COO-C_2H_5$	$COO-C_2H_5$	H	오일

Ex.	Ar	X	R^1	R^2	R^3	m.p. [°C] (n$_D^{30}$)
68	"	O	COO-CH$_3$	COO-C$_2$H$_5$	H	(1.5558)
69		O	COO-C$_2$H$_5$	COO-C$_2$H$_5$	H	82-83
70		O	COO-CH$_3$	COO-CH$_3$	H	88.5
71	"	O	COO-CH$_3$	COO-C$_2$H$_5$	H	(1.5486)
72	"	O	COO-CH$_3$	COO-C$_2$H$_5$	CH$_3$	

Ex.	Ar	X	R^1	R^2	R^3	m.p. [°C] (n$_D^{30}$)
73	"	O	COO-CH$_3$	COO-C$_2$H$_5$	Br	
74	"	O	COO-CH$_3$	COO-C$_2$H$_5$	C$_2$H$_5$	
75	"	O	COO-C$_2$H$_5$	COO-CH$_2$-CH=CH$_2$	H	오일
76	"	O	COO-CH$_2$-CH=CH$_2$	COO-CH$_2$-CH=CH$_2$	CH$_3$	
77	"	O	COO-C$_3$H$_7$	COO-C$_3$H$_7$	H	
78	"	O	COO-CH$_2$CCl$_3$	COO-CH$_2$-CCl$_3$	H	
79	"	O	COO-CH$_2$CH$_2$Cl	COO-CH$_2$CH$_2$Cl	H	
80	"	O	COO-C$_5$H$_{11}$(n)	COO-C$_5$H$_{11}$(n)	H	
81		O	COO-C$_2$H$_5$	COO-C$_2$H$_5$	H	오일

C.

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[3]

활성 화합물	적 용 율 [활성성분 g/ha]		손 상 율[%]		
	제 초 제	독성완화제	TA	HV	TD
H1	400	--	40	98	98
	200	--	30	90	95
	100	--	10	80	95
H1 +	400	50	10	20	10
실시예 28/표 2	200	25	0	0	0
	100	12	0	0	0
H6 +	400	50	10	25	15
실시예 31/표 2	200	25	0	15	0
	100	12	0	0	0
H6 +	400	100	15	25	20
실시예 27/표 2	200	50	0	10	5
	100	25	0	0	0
H2	1800	--	--	40	--
	900	--	--	10	--
H2 +	1800	225	--	0	--
실시예 71/표 2	900	112	--	0	--
H3	50	--	70	60	--
	25	--	80	30	--
	12	--	15	20	--
H3 +	50	25	20	10	--
실시예 28/표 2	25	12	10	5	--
	12	6	0	0	--
H3 +	50	25	15	10	--
실시예 71/표 2	25	12	0	0	--
	12	6	0	0	--

활성 화합물	적 용 율 [활성성분 g/ha]		손 상 율[%]		
	제 초 제	독성완화제	TA	HV	TD
H3 +	50	25	25	20	--
실시예 75/ 표 2	25	12	5	5	--
	12	6	0	0	--
H3 +	50	25	25	20	--
실시예 31/ 표 2	25	12	15	10	--
	12	6	0	0	--

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H1 =   - P-

H2 =   -

H3 =   4-   - 2- [3- (4-   - 6-   - 1,3,5-   - 2-   )

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HV =   (Horedum vulgare) (   ),

TA =   (Triticum aestivum) (   ),

TA =   (Triticum durm) (   ),

          /   =

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[4]

활 성 성 분	적 용 율 [활성성분 g/ha]		·손 상 율 [%]
	제 초 제	독성완화제	HV
H1	200		85
H1 + 실시예 27/표 2	200	1250	50
H1 + 실시예 30/표 2	200	1250	65
H1 + 실시예 50/표 2	200	1250	30
H1 + 실시예 64/표 2	200	1250	35
H1 + 실시예 70/표 2	200	1250	30
H1 + 실시예 32/표 2	200	1250	50
H1 + 실시예 75/표 2	200	1250	33
H1 + 실시예 39/표 2	200	1250	25
H1 + 실시예 19/표 2	200	1250	60
H1 + 실시예 51/표 2	200	1250	50

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[2]

          ,   . (weed grass)   4   5-
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                                    .   5   7   .

[5]

          (Zea mays)

활 성 화 합 물	적용율[활성성분 g/ha]		옥수수에 대한 손상율 [%]	
	제 초 제	독성완화제	Alois 변 종	Felix 변 종
H4	300	--	60	60
	150	--	55	50
	75	--	40	30
	38	--	20	0
H4 + 실시예 28/표 2	300	150	30	25
	150	75	10	15
	75	38	0	0
	38	19	0	0
H4 + 실시예 31/표 2	300	150	40	30
	150	75	15	10
	75	38	0	0
	38	.19	0	0
H5	200	--	50	45
	100	--	40	35
	50	--	30	25

활 성 화 합 물	적용율[활성성분 g/ha]		옥수수에 대한 손상율 [%]	
	제 초 제	독성완화제	Alois 변 종	Felix 변 종
H5 + 실시예 28/표 2	200	100	20	15
	100	50	10	5
	50	25	0	0
H5 + 실시예 71/표 2	200	100	20	20
	100	50	5	10
	50	25	0	0

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H4 =   3- (4,6-   - 2-   )   - 2-

H5 = 5-   - 2- (4-   - 4-   - 5-   - 2-   - 2-)   - 3-   (   )

[6]

(Zea mays)

활 성 화 합 물	적용율[활성성분 g/ha]		옥수수 변종에 대한 손상율 [%]		
	제 초 제	독성완화제	Mutin	Felix	Dea
H6	80	--	40	5	--
	40	--	20	5	--
	20	--	5	10	--
H6 + 실시예 71/표 2	80	40	10	5	--
	40	20	0	0	--
	20	10	0	0	--
H6 + 실시예 70/표 2	80	40	20	15	--
	40	20	5	0	--
	20	10	0	0	--

활 성 화 합 물	적용율[활성성분 g/ha]		옥수수 변종에 대한 손상율 [%]		
	제 초 제	독성완화제	Mutin	Felix	Dea
H7	60	--	70	75	--
	30	--	30	40	--
	15	--	10	15	--
	8	--	5	0	--
H7 + 실시예 71/표 2	60	30	20	25	--
	30	15	5	10	--
	15	7.5	0	0	--
	8	4	0	0	--
H7 + 실시예 70/표 2	60	30	25	25	--
	30	15	10	5	--
	15	7.5	0	0	--
	8	4	0	0	--
H8	200	--	65	70	35
	100	--	60	65	10
	50	--	30	55	0
	25	--	15	25	0
H8 + 실시예 31/표 2	200	100	40	25	0
	100	50	20	10	0
	50	25	0	0	0
	25	12	0	0	0
H8 + 실시예 71/표 2	200	100	35	30	5
	100	50	15	10	0
	50	25	0	0	0
	25	12	0	0	0
H8 + 실시예 75/표 2	200	100	30	30	
	100	50	20	10	0
	50	25	0	0	0
	25	12	0	0	0

활 성 화 합 물	적용율[활성성분 g/ha]		옥수수 변종에 대한 손상율 [%]		
	제 초 제	독성완화제	Mutin	Felix	Dea
H8 + 실시예 28/표 2	200	100	30	30	0
	100	50	20	10	0
	50	25	0	0	0
	25	12	0	0	0

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H6 = 1- (3-   - 2-   )- 3- (4,6-   -

2-)   (DPX- E 9636,   )

H7 = 1- (2-   - 3-)- 3- (4   - 6-   - 1,3,5-

- 2-)   (   )

H8 = 3- (4,6-   - 2-)- 1- [3- (- N-   - N-

)- 2-   ]

[7]

(Zea mays)

활 성 화 합 물	적용율[활성성분 g/ha]		옥수수에 대한 손상율 [%]
	제 초 제	독성완화제	Felix 변 종
H8	75	--	75
H8 + 실시예 50/표 2	75	1250	55
H8 + 실시예 68/표 2	75	1250	20
H8 + 실시예 70/표 2	75	1250	55
H8 + 실시예 19/표 2	75	1250	30

: 3-   ; 3   ; 4

: 6

,   (I)

.   ,   ,

.   (I)

.

[3]

,   .   ,   2cm
     ,   . 3   4-   ,   (I)
                    .   3   ,   ,
                                                    .
             .   8   .

[8]

| 활 성
화 합 물 | 적용율[활성성분 g/ha] | | 손상율[%] |
	제 초 제	독성완화제	ORSA
H1	300	--	80
H1 + 실시예 28/표 2	300	1250	35
: H1 + 실시예 27/표 2	300	1250	70
H1 + 실시예 30/표 2	300	1250	45
H1 + 실시예 50/표 2	300	1250	70
H1 + 실시예 64/표 2	300	1250	70
H1 + 실시예 70/표 2	300	1250	70
H1 + 실시예 32/표 2	300	1250	35
H1 + 실시예 75/표 2	300	1250	30
H1 + 실시예 31/표 2	300	1250	50
H1 + 실시예 39/표 2	300	1250	70
H1 + 실시예 19/표 2	300	1250	45
H1 + 실시예 51/표 2	300	1250	70
H1 + 실시예 71/표 2	300	1250	40

          : 3-   ; 3   ; 4

       :   3

ORSA =   (Oryza sativa) (   )

                                                                          .
                                                        ;   ,
                .

[4]

, 24   25cm   .

, 3   ,   /   .   4   ,
(9   ).

[9]

활 성 화 합 물	적용율[활성성분 g/ha]		손상율[%]
	제 초 제	독성완화제	ORSA-T
H9	450	--	50
H9 +	450	225	33
실시예 28/표 2	450	450	33

:   3

ORSA- T =   (   )

H9 =

3   H1   H8   (I)
.

(57)

1.

(I)   ,
,   .

,

R^1 R^2

$$\begin{matrix} O \\ \parallel \\ -C - R \end{matrix} \quad , \quad \begin{matrix} S \\ \parallel \\ -C - R \end{matrix} \quad , \quad -CN \quad ,$$

$$\begin{matrix} Y\text{-}R^4 \\ | \\ -C - R \\ | \\ Z\text{-}R^5 \end{matrix} \quad \begin{matrix} NR^6 \\ \parallel \\ -C - R \end{matrix} \quad , \quad \begin{matrix} T \\ \parallel \\ -C - Q - (A_iX_i)_q - R \end{matrix}$$

$$\text{또는} \quad \begin{matrix} T \\ \parallel \\ -C\text{-}Q\text{-}R^T \end{matrix}$$

, - CO- Q^1- D- Q^2- CO[, Q^1 Q^2 Q

, D CR'R" C=O(, R' R" C_1- C_4

-) 2] ,

R^3 , , C_1- C_{18}- , C_2- C_8- , C_2- C_8- , C_1- C_{18}- , C_2- C_8- , C_2-
C_8- , C_1- C_{18}- , C_2- C_8- , C_2- C_8- [9

] ; C_1- C_4- , ,

C_3- C_{12}- ; $SiR^aR^bR^c$[, R^a, R^b R^c C_1- C_4

- , C_2- C_4- , C_2- C_4-] ; Ar'X'- [

Ar X Ar X] ,

X O, S, NH- NH NR^d[, R^d R^4] ; - CH$_2$O- , - CH$_2$S- , - CH(A
r)O- - CH(Ar)S- ,

Ar ,

R , 1 30 , ,

, ,

R^T - CO- R, - CS- R, - NR^{f}R^g, - N= CR^{h}R^i $SiR^aR^bR^c$(, R , R^f, R
^{g}, R^h R^i , C_1- C_4- , C_2- C_4- , C_2- C_4- , ,
, R^f R^g N, O S 2 C
$_1$- C_4- 5- 6- , R^a, R^b R^c C_1- C
$_4$- , C_2- C_4- , C_2- C_4- ,) ,

Y Z , , - NR^e(, R^e R^4) ,

R^4 R^5 , , C_1- C_6- , C_2- C_6- , C_2- C_6- , (C_1- C_6-
) [4 , C_1- C_8- , , , ,
C_1- C_8- , CH_2 , 3 C_1- C_8-
, C_1- C_8- , C_1- C_6- , C_2- C_8- , C_2- C_8- , C_2-
C_8- , C_3- C_7- , C_3- C_7- , , - - (C_1- C_4-)
] , , $SiR^aR^bR^c$ (, R^a,
R^b R^c C_1- C_4- , C_2- C_4- , C_2- C_4-)
; C_3- C_8- , C_3- C_8- , 3 7 , ,
[, 6 C_1- C_8- , , C_1- C_8-
, , , , C_1- C_8- , CH_2 , 3
C_1- C_8- , C_1- C_8- , C_1- C_6- , C_2- C_8- , C_2- C_8-
, C_2- C_8- , C_2- C_8- , C_3- C_7- , C_3- C_7- ,
- - (C_1- C_4-)] ,

R^4 R^5 C_2- C_4- , , , , 1 2
C_2- $_4$- ,

R^6 , C_1- C_4- , C_2- C_4- , C_2- C_4- , C_6- C_{12} - , , C_1- C_4- ,
, , - NH- CO- NH_2, - NH- CS- NH_2, - - (C_1- C_4-) , - NH- , - NHSO
$_2$- (C_1- C_4-), C_6- C_{12} - , , NH- SO_2- NH- ,
4 , , (C_1- C_4)- , (C_1- C_4)- , (C_1- C_4)-
(C_1- C_4)- ,

T O, S, NR^7, NOR^7 NO- ,

Q O S ,

q 0 4 ,

i q 0 1 q ,

X_i O, S, NR^7 N- $(A_i- X_i-)q-$ R ,

A_i C_1- C_6- , C_2- C_6- , C_2- C_6- , C_3- C_6-
, C_3- C_6- , , ,

R^7 H, C_1- C_4- , C_2- C_4- , C_2- C_4- , C_3- C_6- , C_3- C_6-
, , .

2.

1 ,

Ar ,

[,

U   ,   ,   ,   ,   , C_1- C_8-   , C_1- C
$_8$-   , C_1- C_8-   , C_1- C_8-   ,   - (C_1- C_4-   )   ,   - (C_1- C_4-   )   , C_1- C_8-
                C_1- C_8-   ,   ,   8   ,   , C_1- C
$_8$-   ,   ,   ,   , CH_2 C_1- C_8-   , C_1-
C_8-   , C_1- C_6-   , C_1- C_6-   , C_2- C_8-   , C_2- C_8-   , C_2- C_8-
       , C_2- C_8-   , C_3- C_7-   , C_3- C_7-   ,   -   - (C_1- C_4-   )
   C_1- C_8-   ,

o   1   5   ,

p   1   7   ],

Ar   ,   ,   ,   ,   ,   ,   ,   ,   ,
                                                                        ,   U
                ,

R   , C_1- C_{18}-   , C_3- C_{12} -   , C_2- C_8-   , C_2- C_8-   ,   ,
                ,   C-   ,   ,   ,   ,   ,
   , C_1- C_8-   (   ), C_1- C_8-   , C_1- C_8-   , C_2- C_8-   , C_2- C_8-
       , C_1- C_8-   , C_1- C_8-   , C_2- C_8-   , C_2- C_8-   , C_3- C_7-   ,
C_3- C_7-   ,   - $NR^* R^{**}$,   - CO- $NR^* R^{**}$,   - O- CO- $NR^* R^{**}$
       (, R^* R^{**} , C_1- C_8-   , C_2- C
$_8$-   ,2- C_8-   ,   ,   ,   N, O   S
           2 C_1- C_4-   3   8-
       ), (C_1- C_8-   )   , (C_1- C_8-   )   , (C_2- C_8-   )   , (C_1- C_8-   )
          , (C_2- C_8-   )   , (C_2- C_8-   )   , (C_2- C_8-   )   ,   , (C_1- C_8-
)   , (C_2- C_8-   )   , (C_2- C_8-   )   , C_1- C_4-   , C_1- C_4-   , (C_1
- C_8-   )   , (C_2- C_8-   )   , (C_2- C_8-   )   , (C_1- C_8-   )
          , (C_2- C_8-   )   , (C_2- C_8-   )   , (C_1- C_8-   )
       ;   , NO_2, C_1- C_4-   (C_1- C_6-   )
          ; (C_2- C_6-   )   , (C_2- C_6-   )   , (C_1- C_8-   )   , (C_2- C_8-
)   , (C_2- C_8-   )   , C_1- C_8-   ,   ,   - C_1- C_6-   ,   - (C_1
- C_6-   )   ,   ,   - C_1- C_6-   ,   - (C_1- C_6-   )   ,   ,
       ,   ,   - (C_1- C_6-   )   ,   - (C_1- C_6-   )   (
                11   , C_1- C_4-   , C_1- C_4-   , C_1- C_4-   , C_1- C_4-
)   - SiR'_3, - O
- SiR'_3, $(R')_3Si$- C_1- C_6-   , - CO- O- NR'_2, - O- N= CR'_2, - N= CR'_2, - O- NR'_2, - $CH(OR')_2$ - O- (C
H_2)m- $CH(OR')_2$ [, R   ; C_1- C_4-   ;   , C_1- C_4-   , C_1- C_4-
   , C_1- C_4-   , C_1- C_4-
                   ; 2 C_2- C_6-   , m   0   6   ]   ,   R" O-
CHR" ' CH(OR")- C_1- C_6-   (R" C_1- C_4- C_1- C_6-
   , R" ' C_1- C_4-   )
                        .

3.

1   2   ,

R   , C_1- C_8-   , C_5- C_6-   , C_2- C_8- C_2- C_8-   ,   ,
          4   )   ,   , C_1- C_4-   , C_2- C_4-   , C_2- C
$_4$-   , C_5- C_6-   , C_5- C_6-   ,   -   - (C_1- C_4-   )   ,   - SiR'
$_3$,   - O- N= CR'$_2$,   - N= CR'$_2$ (R'   ,
C_1- C_2- C_2- C_5-   )
                    ,

R^T - CO- R, - NR^{f}R^g - N= CR^{h}R^i ,

R^f R^g H, C_1- C_2-   ,   ,   - 1-   ,
     - 1-   ,   - 4-   ,   - 1-   - 1-   ,

R^h R^i H, C_1- C_2-   ,   ,

R^4 R^5 ,   , C_1- C_4-   , C_2- C_4-   , C_2- C_4-   , C_5- C_6-
          C_5- C_6-   ,

R^6 , C_1- C_6-   ,   ,   ,   , NH- CO- NH$_2$, - NH- C_1- C_4-   ,

T   O, S   NR^7 ,

Q   O   S   ,

q   0   4   ,

i   q   0   , 1   q   ,

X_i O, S, NR^7 N- (A$_i$- X$_i$-)q- R   ,

A$_i$ C_1- C_4-   , C_2- C_4- C_5- C_6-   ,

R^7 H, C_1- C_4-   , C_2- C_4-   , C_2- C_4- C_5- C_6-
     .

     4.

     1   2   .

R^1 R^2 CN   .

     5.

Ar   , X   1   (I)
     .

     6.

(a)   Ar- (X)n- H(, Ar   X   (I)   , n   1   )   (II)
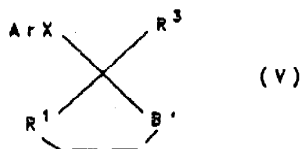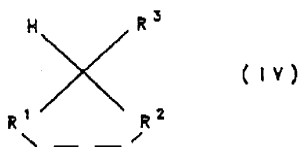   ,

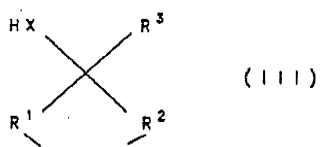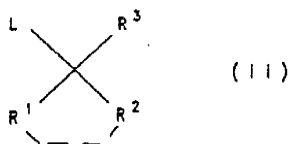(b)   Ar- W(, Ar   W   )   (III)
   ,

(c)   Ar- X- W(, Ar, X   W   )   (IV)
    ,

(d)   (V)   -

     , 5   (I)   :

(II)

(III)

(IV)

(V)

     ,

L   W   ,

Ar, X, R^1, R^2 R^3 (I)   ,

B' $\overset{T}{\underset{\|}{C}}-Q(A_1X_1)_q-R$ 또는 $\overset{T}{\underset{\|}{-COR^T}}$,

R¹   B¹   - CO- Q¹ - D- Q² - CO- (

   , T, Q, A ᵢ, Xᵢ, q, R, R ᵀ, Q¹, Q²   D   (I)
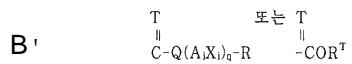
)   .

      7.

   1   (I)   ,
            .

      8.

         ,   1   (I)
            .

      9.

   8   ,

         ,   ,   ,   - ,   -
                              (:   - ,   - ,   - ,   -
                              ),   ,   ,
   ,   ,   ,   S- (N-
)   .

      10.

   9   ,

         :   1:10   10: 1   .

      11.

   1   ,

0.1   99   %   (I)   /   , 1   99.
9   %   ,   0   25   %   .

      12.

         1   (I)   ,   ,   ,
                        ,   .

      13.

   12   ,

,   .

14.

12   13   ,

(I)   0.001   5kg   /ha   1:1O   1O:1   :
            .