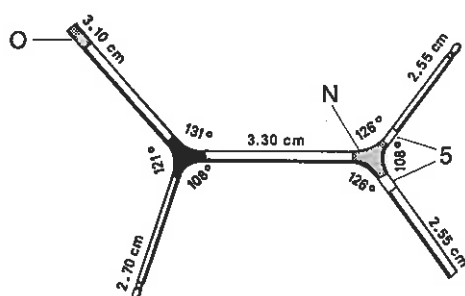
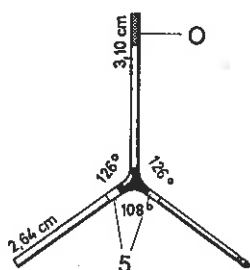


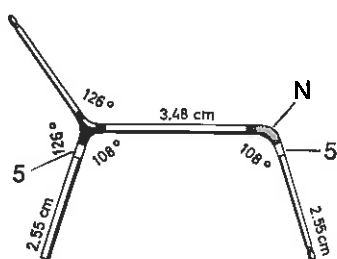
5 b

 $\text{CON} = 5\text{Nex}$ 

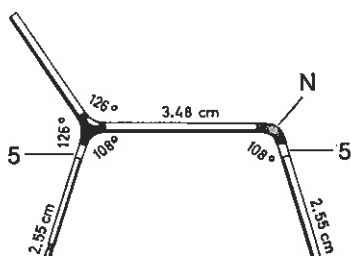
AMID5NEXO

 $\text{C} = \text{O}5$ 

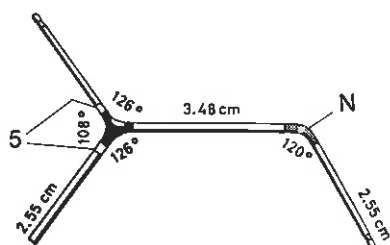
CARBONYL5

 $\text{C} = \text{N} - 5\text{en}$ 

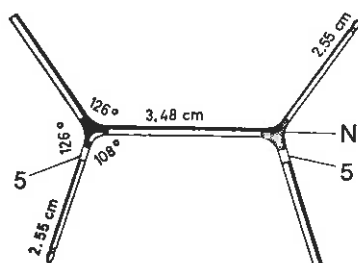
IMIN5ENDO

 $*\text{C} = \text{N} - 5\text{en}$ 

\*IMIN5ENDO

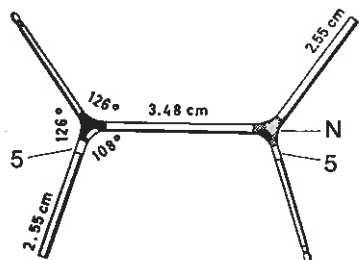
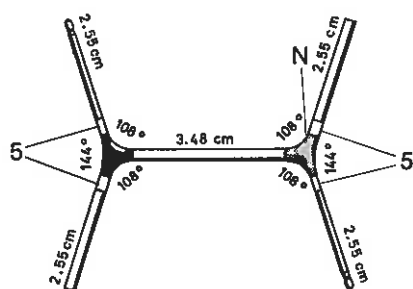
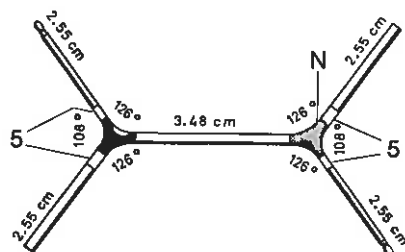
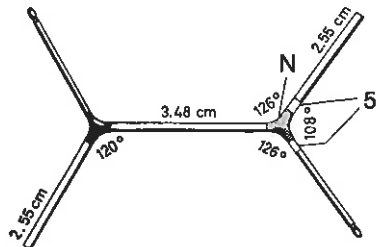
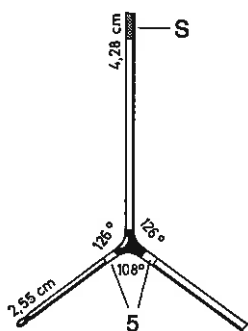
 $\text{C} = \text{N} - 5\text{Cex}$ 

IMIN5CEXO

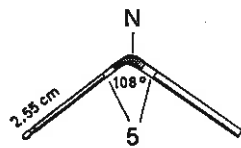
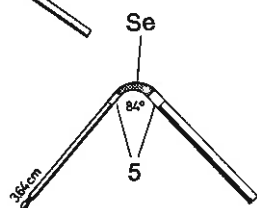
 $\text{C} = \text{N} = 5\text{en}$ 

IMONIUM5ENDO

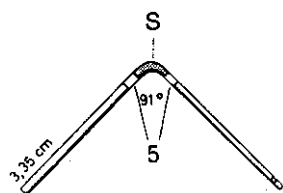
5 b

 $*C=N=5en$ **\*IMONIUM5ENDO** $C=N=5en5en$ **IMONIUM5ENDO5ENDO** $C=N=5ex5ex$ **IMONIUM5EXO5EXO** $C=N=5Nex$ **IMONIUM5NEXO** $C=S5$ **THIOCARBONYL5**

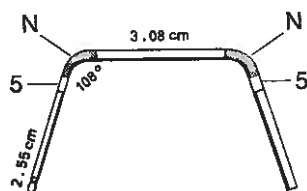
5 c

 $N^2_5$ **BINITROGEN5** $Se^2_5$ **BISELEN5**

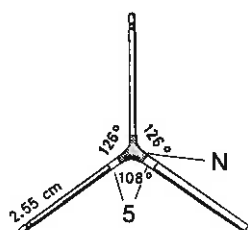
5 c

 $S^2O$ 

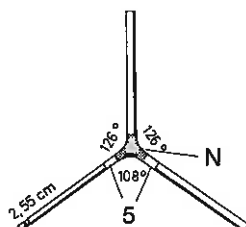
BISULFUR5

 $N=N5cis$ 

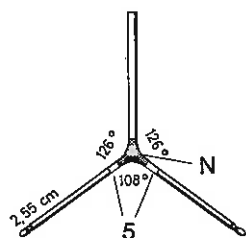
CISAZO5

 $N^3O5pl$ 

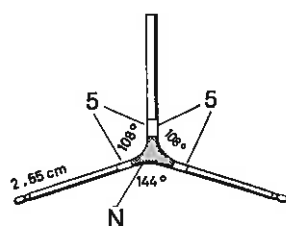
TRINITROGEN5PLAN

 $*N^3O5pl$ 

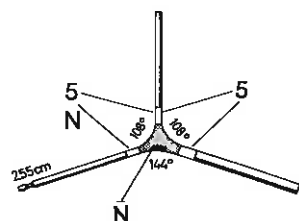
\*TRINITROGEN5PLAN

 $**N^3O5pl$ 

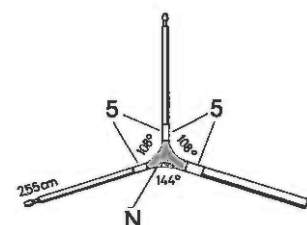
\*\*TRINITROGEN5PLAN

 $N^3O5,5pl$ 

TRINITROGEN5,5PLAN

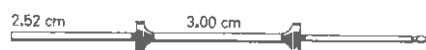
 $*N^3O5,5pl$ 

\*TRINITROGEN5,5PLAN

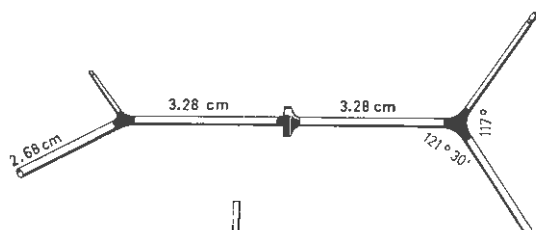
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\*\*TRINITROGEN5,5PLAN

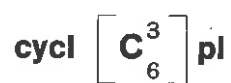
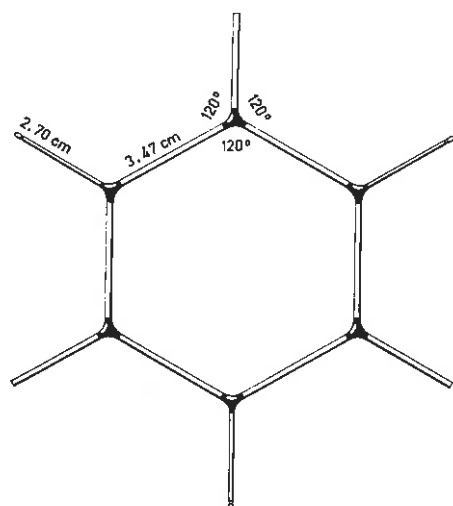
6a



ACETYLEN



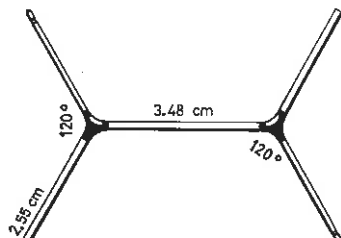
ALLEN



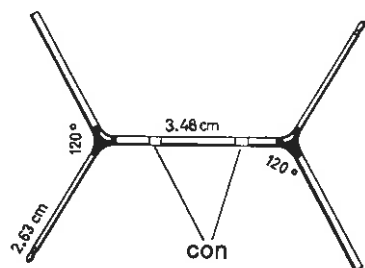
BENZOL



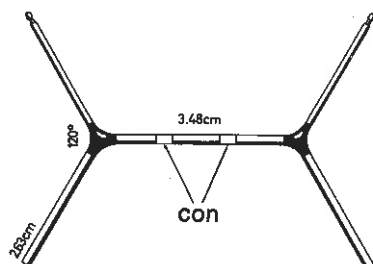
BICARBONLIN



DOBAROM

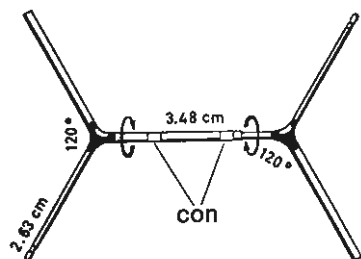


DOBCON

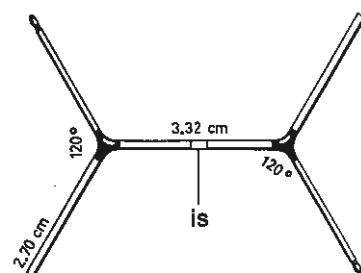


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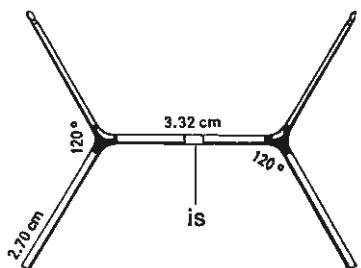
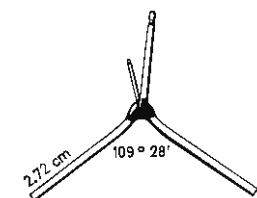
6 a

 $C=C$ confrot

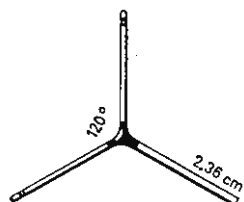
DOBCONFROT

 $C=C$ 

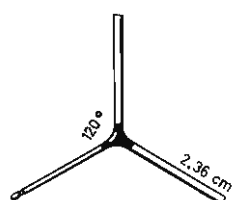
DOBISOL

 $*C=C$  $*DOBISOL$  $C^4$ 

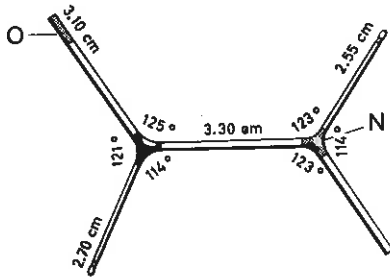
TETRACARBON

 $C^3_{pl}$ 

TRICARBONPLAN

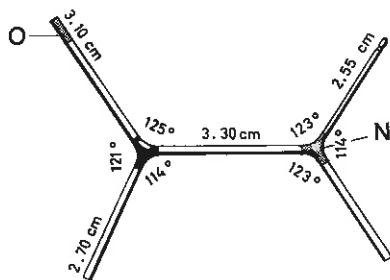
 $*C^3_{pl}$  $*TRICARBONPLAN$

6 b



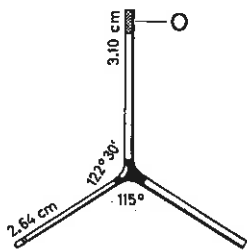
CON=

AMID



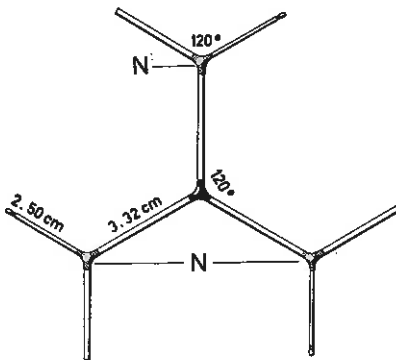
\*CON=

\*AMID

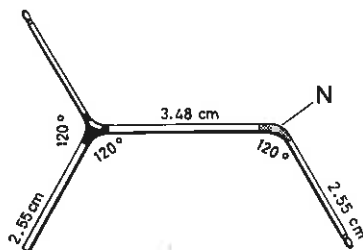


C=O

CARBONYL

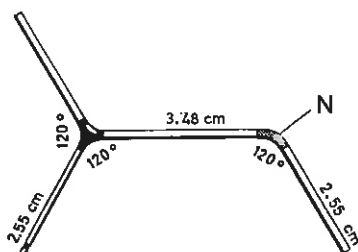
C(N=)<sub>3</sub>

GUANIDINIUM



C=N-

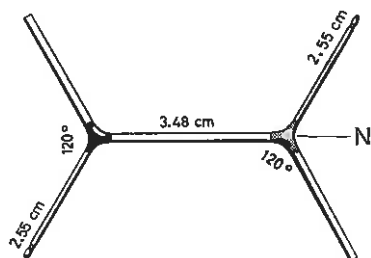
IMIN



\*C=N-

\*IMIN

6 b



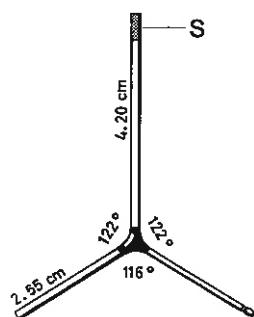
IMONIUM



NITRIL

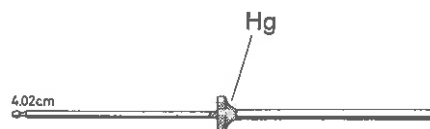


\*NITRIL

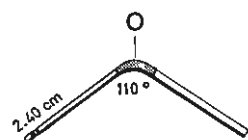


THIOCARBONYL

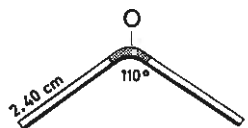
6 c



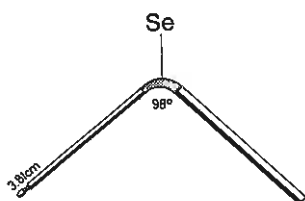
BIMERCUR



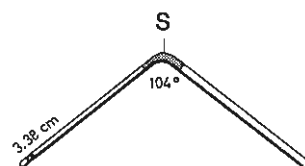
BIOXYGEN



\*BIOXYGEN

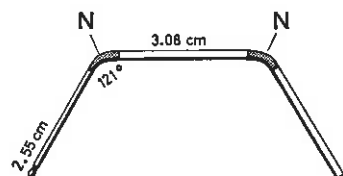


BISELEN

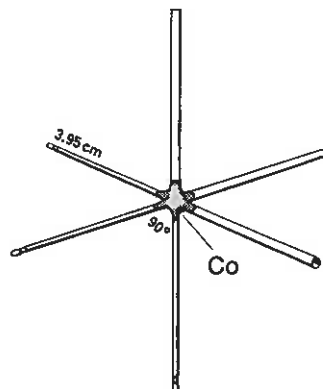


BISULFUR

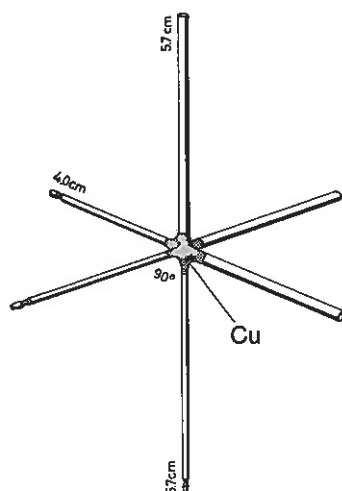
6 c

 $N = N_{cis}$ 

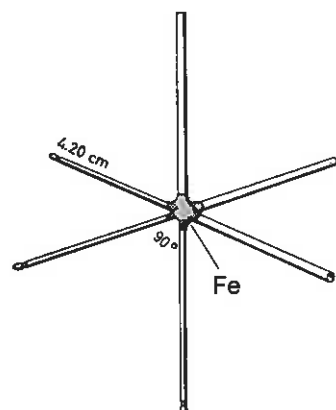
CISAZO

 $Co^6$ 

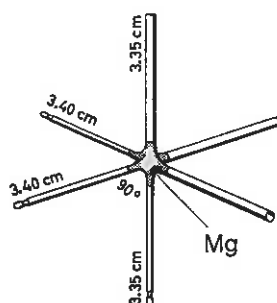
HEXACOBALT

 $Cu^6$ 

HEXACOPPER

 $Fe^6$ 

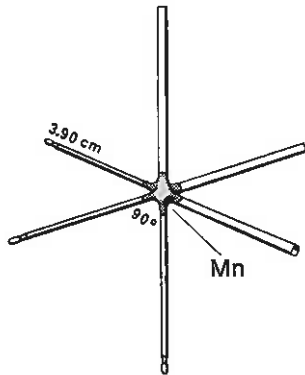
HEXAFER

 $Mg^6$ 

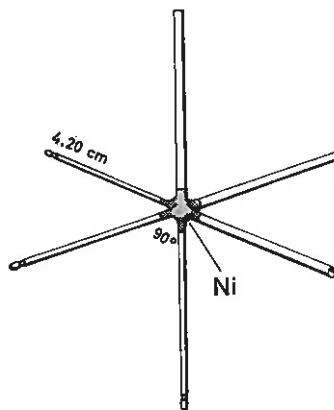
HEXAMAGNESIUM



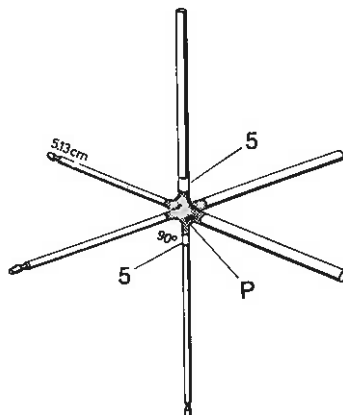
6 c


 $\text{Mn}^6$ 

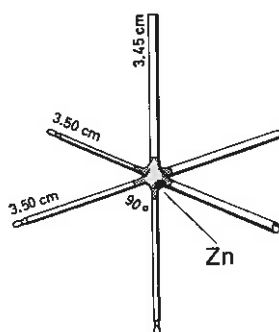
HEXAMANGAN


 $\text{Ni}^6$ 

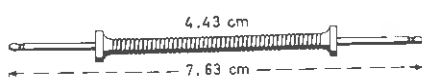
HEXANICKEL


 $\text{P}^6$ 

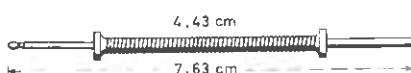
HEXAPHOSPHOR


 $\text{Zn}^6$ 

HEXAZINC


 $-\text{H}\dots$ 

INTERHYDROGEN


 $^*-\text{H}\dots$ 

\*INTERHYDROGEN

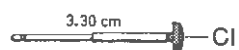
6 c

 $\text{Br}^1$ 

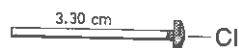
MONOBROM

 $*\text{Br}^1$ 

\*MONOBROM

 $\text{Cl}^1$ 

MONOCHLOR

 $*\text{Cl}^1$ 

\*MONOCHLOR

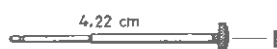


1

MONOFLUOR

 $*\text{F}^1$ 

\*MONOFLUOR

 $\text{I}^1$ 

MONOIOD

 $*\text{I}^1$ 

\*MONOIOD

 $\text{O}^1$ 

MONOXYGEN

 $*\text{O}^1$ 

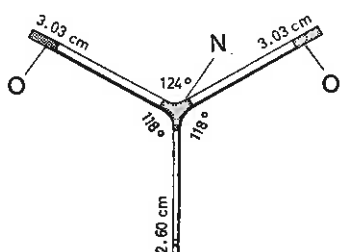
\*MONOXYGEN

 $\text{S}^1$ 

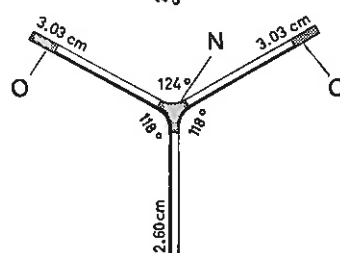
MONOSULFUR

 $*\text{S}^1$ 

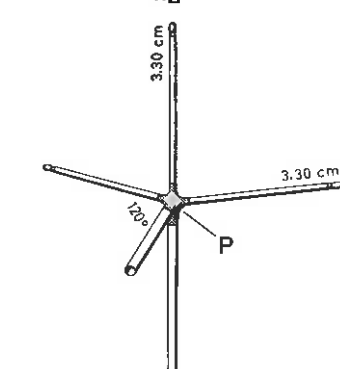
\* MONOSULFUR

 $-\text{NO}_2$ 

NITRO

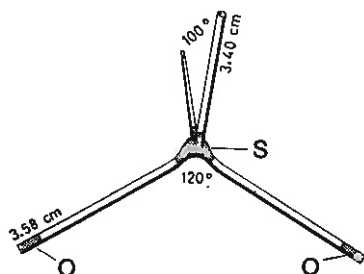
 $*-\text{NO}_2$ 

\* NITRO

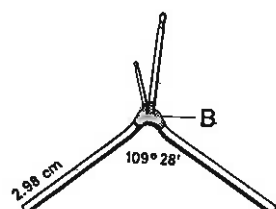
 $\text{P}^5$ 

PENTAPHOSPHOR

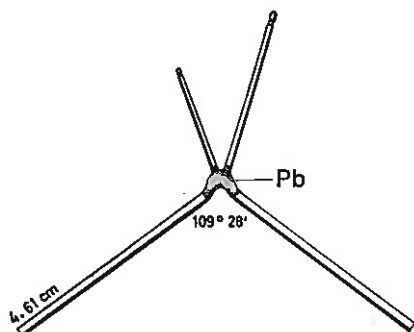
6 c



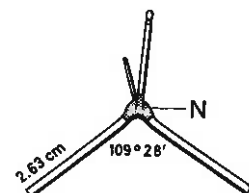
SULFON



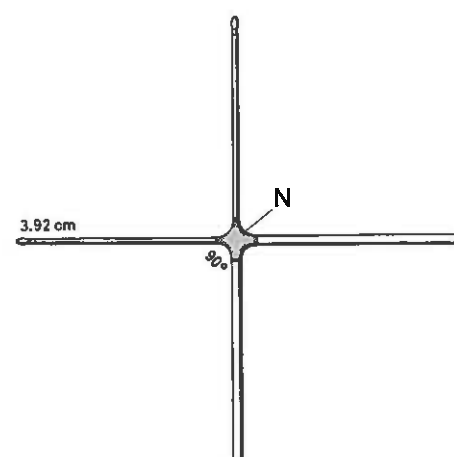
TETRABOR



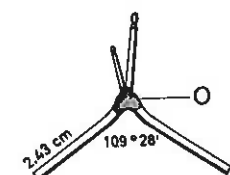
TETRALEAD



TETRANITROGEN

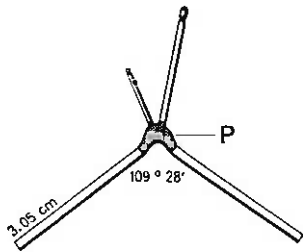


TETRANICKELPLAN

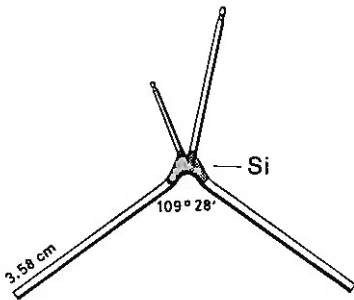


TETRAOXYGEN

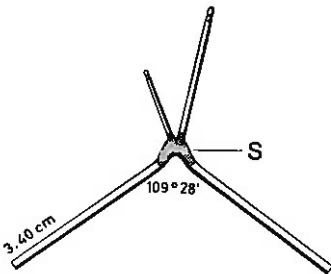
6c

 $P^4$ 

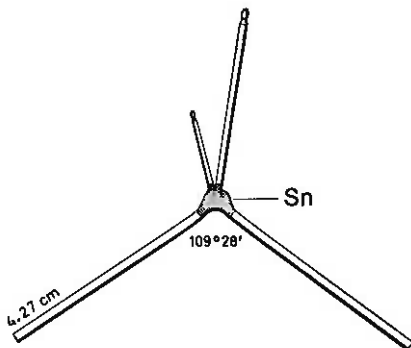
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 $Si^4$ 

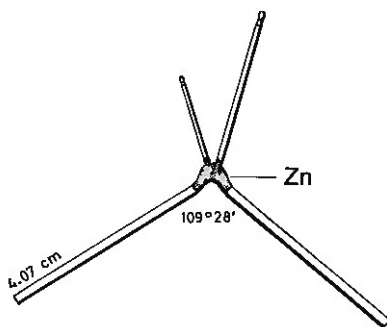
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 $S^4$ 

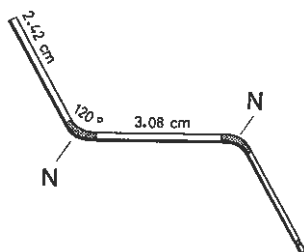
TETRASULFUR

 $Sn^4$ 

TETRATIN

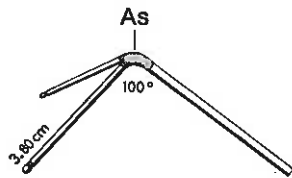
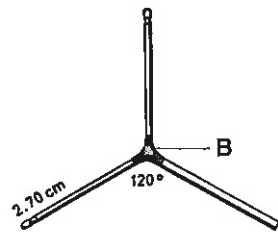
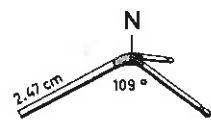
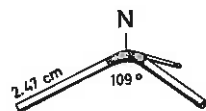
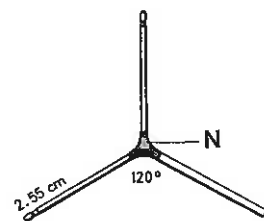
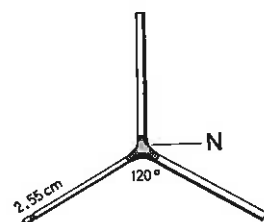
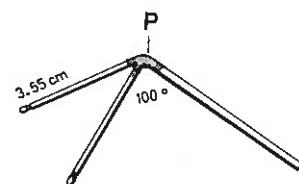
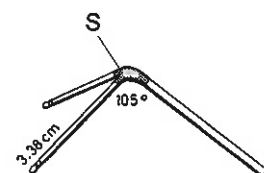
 $Zn^4$ 

TETRAZINC

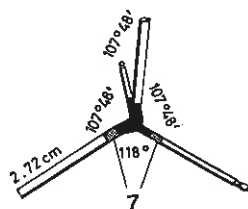
 $N=N_{trans}$ 

TRANSAZO

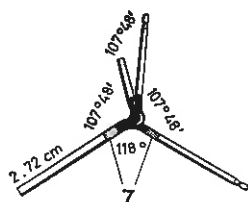
6c


**TRIARSEN**

**TRIBOR**

**TRINITROGEN**

**\*TRINITROGEN**

**TRINITROGENPLAN**

**\*TRINITROGENPLAN**

**TRIPHOSPHOR**

**TRISULFUR**

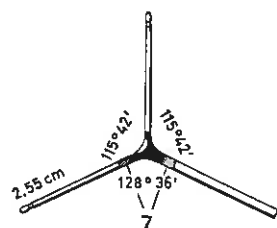
7a

 $C^4_7$ 

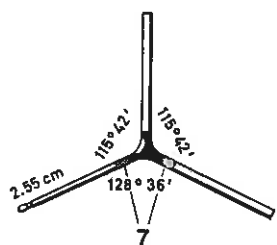
TETRACARBON7

 $*C^4_7$ 

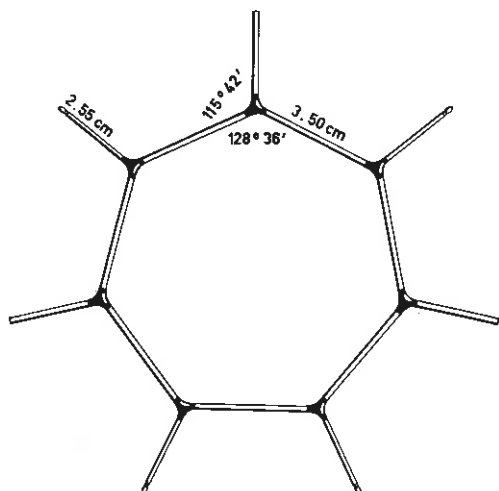
\*TETRACARBON7

 $C^3_{con7pl}$ 

TRICARBONCON7PLAN

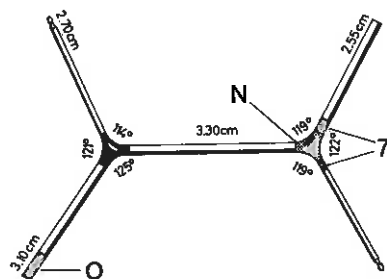
 $*C^3_{con7pl}$ 

\*TRICARBONCON7PLAN

 $cycl \left[ C^3_7 \right] pl$ 

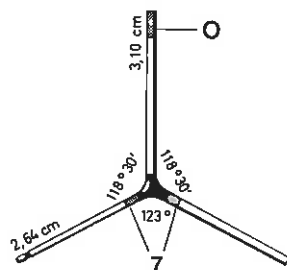
TROPYLIUM

7b



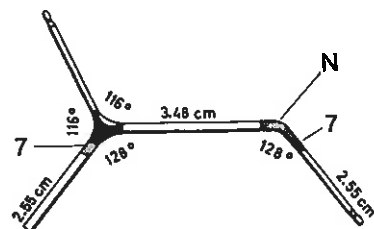
CON=7ex

AMID7NEXO



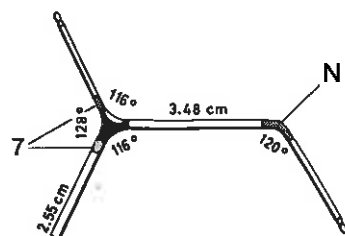
C=O7

CARBONYL7



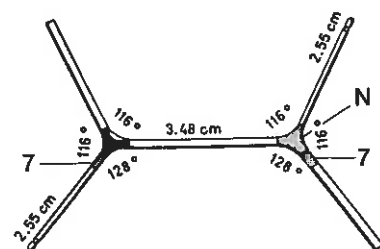
C = N - 7en

IMIN7ENDO



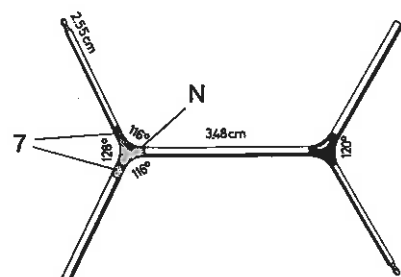
C = N - 7ex

IMIN7EXO



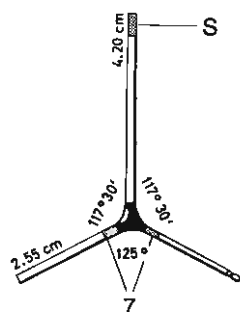
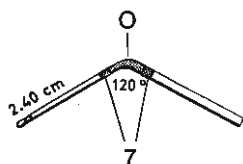
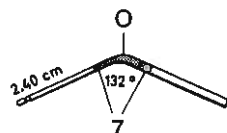
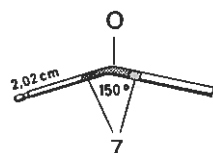
C = N = 7en

IMONIUM7ENDO



C=N=7Nex

IMONIUM7NEXO

**7 b****C = S7****THIOCARBONYL7****7c****O<sup>2</sup> 7****BIOXYGEN7****O<sup>2</sup>(132)****BIOXYGEN - 132°****O<sup>2</sup>(150)****BIOXYGEN - 150°**



Alle Modelle und Hilfseinheiten sind einzeln oder in folgenden Bausätzen erhältlich:

All units and aids are available as single units or within the following sets:

Chaque modèle (ou unité secondaire) est livrable seul ou avec les compositions suivantes:

### Simple-Set

|    |              |                |
|----|--------------|----------------|
| 2  | $C \equiv C$ | ACETYLEN       |
| 5  | $O^2$        | BIOXYGEN       |
| 5  | $C=O$        | CARBONYL       |
| 9  | $C=Car$      | DOBAROM        |
| 5  | $C=Ccon$     | DOBCON         |
| 5  | $C=C$        | DOBISOL        |
| 50 | $C^4$        | TETRACARBON    |
| 5  | $N^3$        | TRINITROGEN    |
| 1  |              | ANGSTROEMSCALA |

### Normal-Set

|    |                                |                         |
|----|--------------------------------|-------------------------|
| 2  | $C \equiv C$                   | ACETYLEN                |
| 2  | $CON=$                         | AMID                    |
| 2  | $cycl \left[ C_6^3 \right] pl$ | BENZOL                  |
| 5  | $O^2$                          | BIOXYGEN                |
| 1  | $S^2$                          | BISULFUR                |
| 5  | $C=O$                          | CARBONYL                |
| 9  | $C=Car$                        | DOBAROM                 |
| 5  | $C=Ccon$                       | DOBCON                  |
| 5  | $C=C$                          | DOBISOL                 |
| 2  | $C=N-$                         | IMIN                    |
| 1  | $*C=N-$                        | *IMIN                   |
| 1  | $C=N=$                         | IMONIUM                 |
| 1  | $Br^1$                         | MONOBROM                |
| 1  | $*Br^1$                        | *MONOBROM               |
| 1  | $Cl^1$                         | MONOCHLOR               |
| 1  | $*Cl^1$                        | *MONOCHLOR              |
| 1  | $F^1$                          | MONOFLUOR               |
| 1  | $*F^1$                         | *MONOFLUOR              |
| 1  | $I^1$                          | MONOJOD                 |
| 1  | $*I^1$                         | *MONOJOD                |
| 1  | $O^1$                          | MONOXYGEN               |
| 1  | $*O^1$                         | *MONOXYGEN              |
| 1  | $C \equiv N$                   | NITRIL                  |
| 1  | $*C \equiv N$                  | *NITRIL                 |
| 50 | $C^4$                          | TETRACARBON             |
| 2  | $N^4$                          | TETRANITROGEN           |
| 1  | $P^4$                          | TETRAPHOSPHOR           |
| 1  | $C^3pl$                        | TRICARBONPLAN           |
| 1  | $*C^3pl$                       | *TRICARBONPLAN          |
| 5  | $N^3$                          | TRINITROGEN             |
| 2  | $N^3pl$                        | TRINITROGENPLAN         |
| 1  | $P^3$                          | TRIPHOSPHOR             |
| 1  |                                | ANGSTROEMSCALA          |
| 12 |                                | C-EXTENSION             |
| 12 |                                | H-EXTENSION             |
| 12 |                                | *H-EXTENSION            |
| 20 |                                | ROTORESISTOR            |
| 5  |                                | VAN DER WAALS H-RADIUS  |
| 5  |                                | *VAN DER WAALS H-RADIUS |

### 5-Ring-Supplement-Set

|    |                |                   |
|----|----------------|-------------------|
| 1  | $CON=5en$      | AMID5ENDO         |
| 1  | $*CON=5en$     | *AMID5ENDO        |
| 1  | $S^5$          | BISULFUR5         |
| 3  | $C=O5$         | CARBONYL5         |
| 4  | $C=Car5en$     | DOBAROM5ENDO      |
| 4  | $C=Ccon5en$    | DOBCON5ENDO       |
| 1  | $C=Ccon5en5ex$ | DOBCON5ENDO5EXO   |
| 1  | $C=Ccon5ex$    | DOBCON5EXO        |
| 1  | $C=Ccon5ex6en$ | DOBCON5EXO6ENDO   |
| 5  | $C=C5en$       | DOB5ENDO          |
| 3  | $C=C5ex$       | DOB5EXO           |
| 1  | $C=N-5Cex$     | IMIN5CEXO         |
| 1  | $C=N-5en$      | IMIN5ENDO         |
| 1  | $*C=N-5en$     | *IMIN5ENDO        |
| 1  | $C=N=5en$      | IMONIUM5ENDO      |
| 1  | $*C=N=5en$     | *IMONIUM5ENDO     |
| 1  | $C=N=5Nex$     | IMONIUM5NEXO      |
| 15 | $C^45$         | TETRACARBON5      |
| 3  | $*C^45$        | *TETRACARBON5     |
| 1  | $N^35pl$       | TRINITROGEN5PLAN  |
| 1  | $*N^35pl$      | *TRINITROGEN5PLAN |

### 3-Ring-Supplement-Set

|   |                                 |             |
|---|---------------------------------|-------------|
| 4 | $cycl \left[ C_3^4 \right]$     | CYCLOPROPAN |
| 3 | $cycl \left[ C_2^4 O^2 \right]$ | OXIRAN      |
| 3 | $cycl \left[ C_2^4 N^3 \right]$ | AZIRIDIN    |

### 4-Ring-Supplement-Set

|    |            |               |
|----|------------|---------------|
| 1  | $CON=4en$  | AMID4ENDO     |
| 1  | $O^4$      | BIOXYGEN4     |
| 2  | $C=O4$     | CARBONYL4     |
| 3  | $C=Car4en$ | DOBAROM4ENDO  |
| 3  | $C=C4en$   | DOB4ENDO      |
| 2  | $C=C4ex$   | DOB4EXO       |
| 12 | $C^44$     | TETRACARBON4  |
| 5  | $*C^44$    | *TETRACARBON4 |
| 1  | $N^44$     | TRINITROGEN4  |

**7-Ring-Supplement-Set**

|    |                        |                    |
|----|------------------------|--------------------|
| 1  | O <sup>27</sup>        | BIOXYGEN7          |
| 1  | C=O 7                  | CARBONYL7          |
| 20 | C <sup>47</sup>        | TETRACARBON7       |
| 5  | *C <sup>47</sup>       | *TETRACARBON7      |
| 5  | C <sup>3</sup> con7pl  | TRICARBONCON7PLAN  |
| 2  | *C <sup>3</sup> con7pl | *TRICARBONCON7PLAN |

**New Peptide-A-Set**

|     |                       |                  |
|-----|-----------------------|------------------|
| 60  | CON=                  | AMID             |
| 6   | cyclC <sub>6</sub> pl | BENZOL           |
| 10  | O <sup>2</sup>        | BIOXYGEN         |
| 6   | S <sup>2</sup>        | BISULFUR         |
| 5   | C=O                   | CARBONYL         |
| 6   | C=Car                 | DOBAROM          |
| 3   | C=Car5en              | DOBAROM5ENDO     |
| 3   | C=Ccon5en             | DOBCON5ENDO      |
| 3   | C=C5en                | DOB5ENDO         |
| 1   | C(N=) <sub>3</sub>    | GUANIDINIUM      |
| 3   | C=N-5en               | IMIN5ENDO        |
| 60  | -H . . . .            | INTERHYDROGEN    |
| 5   | O <sup>1</sup>        | MONOXYGEN        |
| 1   |                       | PROLIN (TRANS)   |
| 150 | C <sup>4</sup>        | TETRACARBON      |
| 5   | N <sup>4</sup>        | TETRANITROGEN    |
| 3   | N <sup>3</sup> 5pl    | TRINITROGEN5PLAN |
| 1   |                       | ANGSTROEMSCALA   |

**Porphyrin-Set**

|    |                        |                    |
|----|------------------------|--------------------|
| 2  | CON=                   | AMID               |
| 2  | *CON=                  | *AMID              |
| 6  | N <sup>25</sup>        | BINITROGEN5        |
| 5  | O <sup>2</sup>         | BIOXYGEN           |
| 5  | C=O                    | CARBONYL           |
| 12 | C=Ccon5en              | DOBCON5ENDO        |
| 3  | C=Ccon5en5ex           | DOBCON5ENDO5EXO    |
| 6  | C=Ccon5ex              | DOBCON5EXO         |
| 5  | C=C                    | DOBISOL            |
| 2  | Co <sup>6</sup>        | HEXACOBALT         |
| 2  | Fe <sup>6</sup>        | HEXAFER            |
| 3  | C=N=5en                | IMONIUM5ENDO       |
| 3  | *C=N=5en               | *IMONIUM5ENDO      |
| 20 | C <sup>4</sup>         | TETRACARBON        |
| 2  | Ni <sup>4</sup> pl     | TETRANICKELPLAN    |
| 12 | C <sup>3</sup> con5pl  | TRICARBONCON5PLAN  |
| 12 | *C <sup>3</sup> con5pl | *TRICARBONCON5PLAN |
| 12 | C <sup>3</sup> con7pl  | TRICARBONCON7PLAN  |
| 3  | *C <sup>3</sup> con7pl | *TRICARBONCON7PLAN |
| 6  | N <sup>3</sup> 5pl     | TRINITROGEN5PLAN   |
| 6  | *N <sup>3</sup> 5pl    | *TRINITROGEN5PLAN  |
| 1  |                        | ANGSTROEMSCALA     |

**Nucleic-Acid-Set**

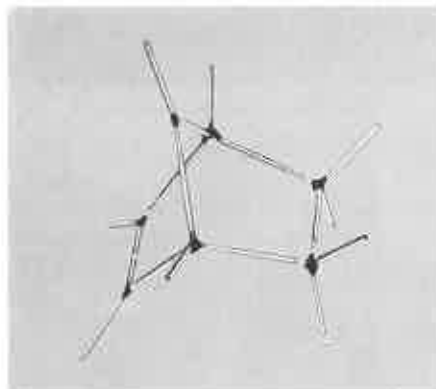
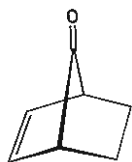
(example: DNA with 5 Thymine,  
5 Adenine, 6 Cytosine, 6 Guanine)

|     |                     |                   |
|-----|---------------------|-------------------|
| 5   | CON=                | AMID              |
| 44  | O <sup>2</sup>      | BIOXYGEN          |
| 44  | O <sup>27</sup>     | BIOXYGEN7         |
| 17  | C=O                 | CARBONYL          |
| 11  | C=Car               | DOBAROM           |
| 11  | C=Car5en            | DOBAROM5ENDO      |
| 6   | C=N-                | IMIN              |
| 5   | *C=N-               | *IMIN             |
| 6   | C=N-5en             | IMIN5ENDO         |
| 5   | *C=N-5en            | *IMIN5ENDO        |
| 11  | C=N=                | IMONIUM           |
| 20  | O <sup>1</sup>      | MONOXYGEN         |
| 113 | C <sup>4</sup>      | TETRACARBON       |
| 20  | P <sup>4</sup>      | TETRAPHOSPHOR     |
| 17  | N <sup>3</sup> pl   | TRINITROGENPLAN   |
| 17  | *N <sup>3</sup> pl  | *TRINITROGENPLAN  |
| 11  | *N <sup>3</sup> 5pl | *TRINITROGEN5PLAN |
| 11  |                     | BASE-PAIR-SUPPORT |
| 1   |                     | DNA-BASE WITH ROD |
| 17  |                     | DNA-H-BOND        |
| 1   |                     | ANGSTROEMSCALA    |

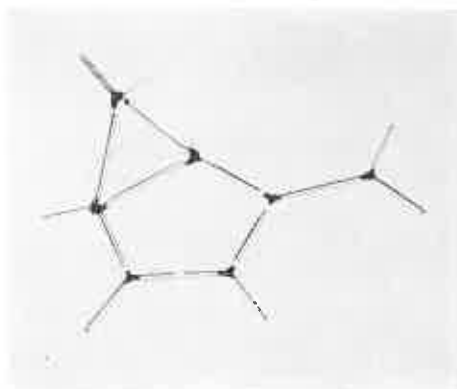
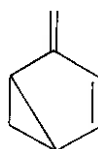
Das DNA-Modell kann auch zusammengebaut  
geliefert werden (Mit Grundplatte)

The DNA model is also available in assembled  
form (With support)

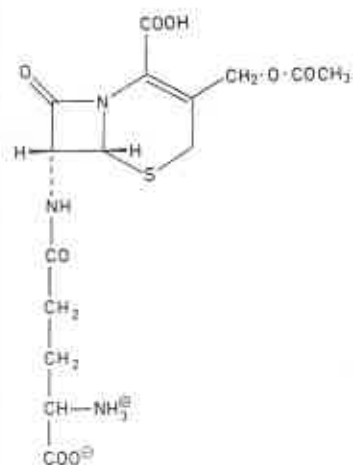
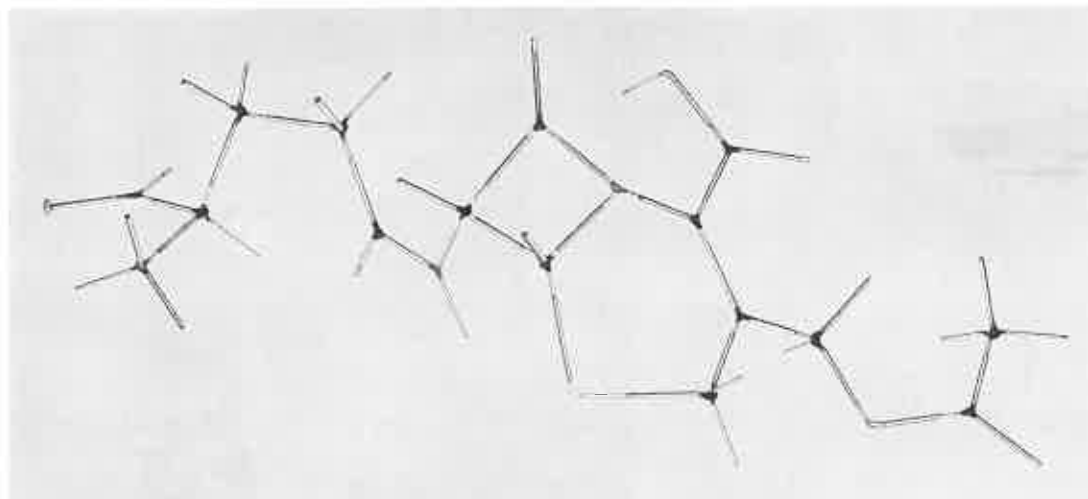
Le modèle DNA est aussi livrable assemblé  
(Avec support)



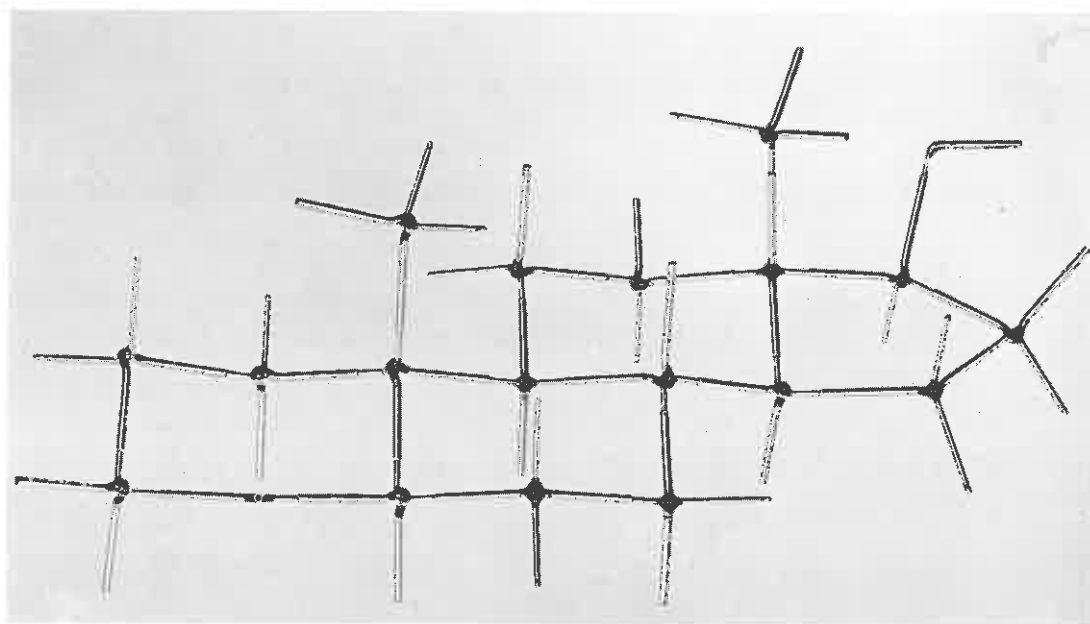
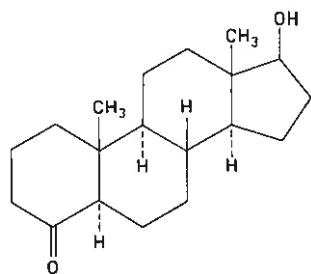
BICYCLO (2.2.1) - HEPTEN - 7 - ON



HOMOFULVEN

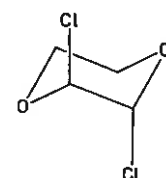
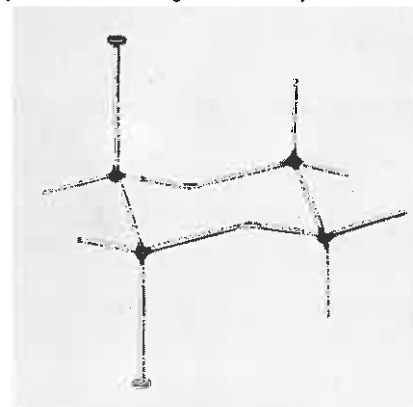
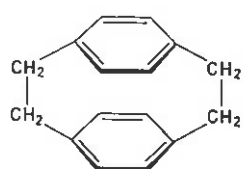
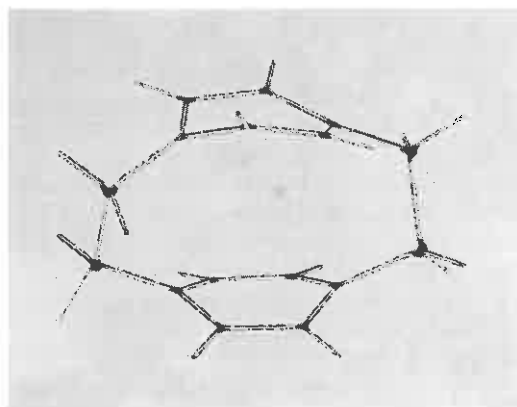


CEPHALOSPORIN - C



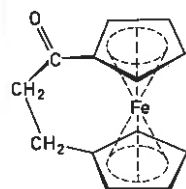
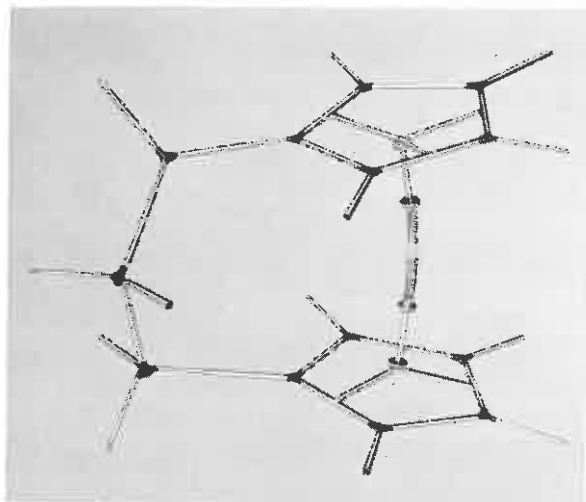
5 - EPIANDROSTAN - 3 - ON - 17 - OL

(Ansicht entsprechend der Oktantenregel)  
(view according to octant rule)  
(Représenté selon la règle de l'octante)

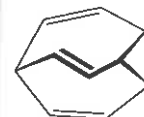
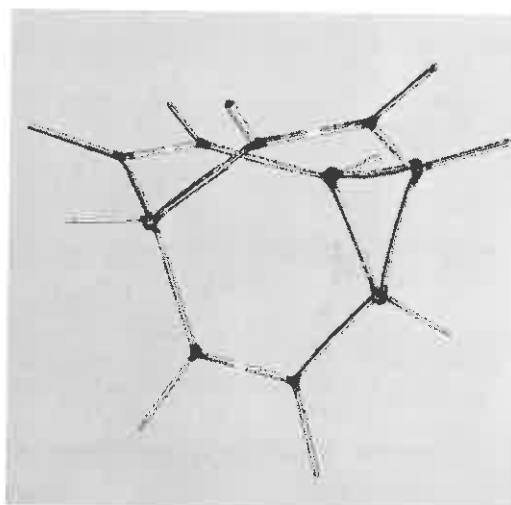


2, 3 - DICHLORDIOXAN

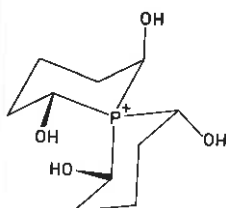
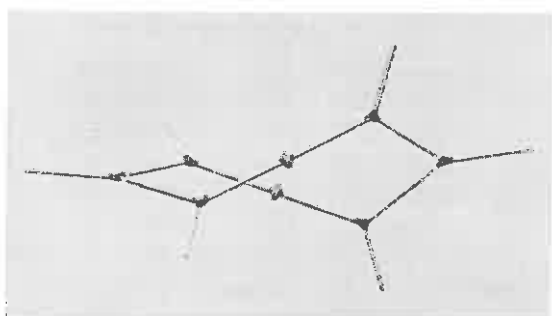
p - CYCLOPHAN



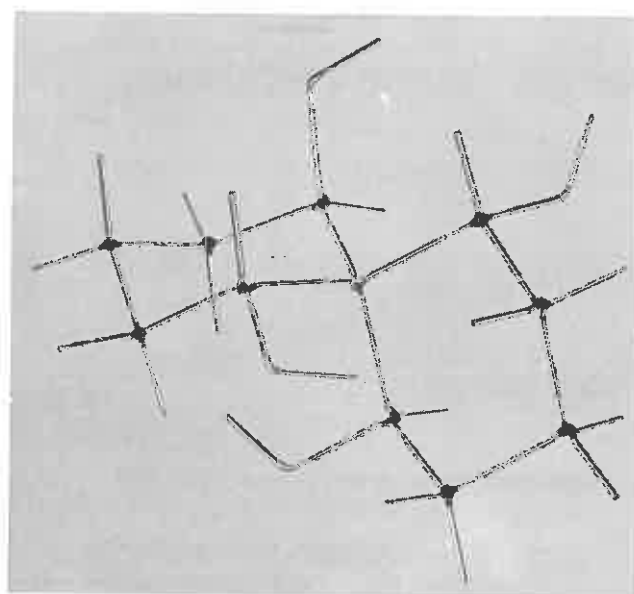
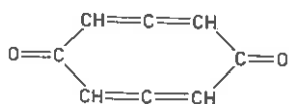
1, 1' - (α - KETOTRIMETHYLEN) - FERROCEN



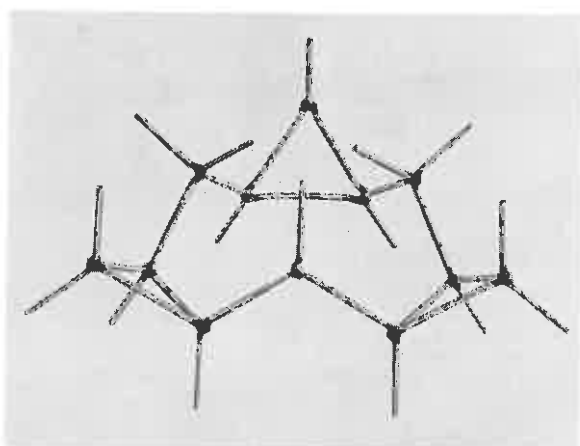
BULLVALEN



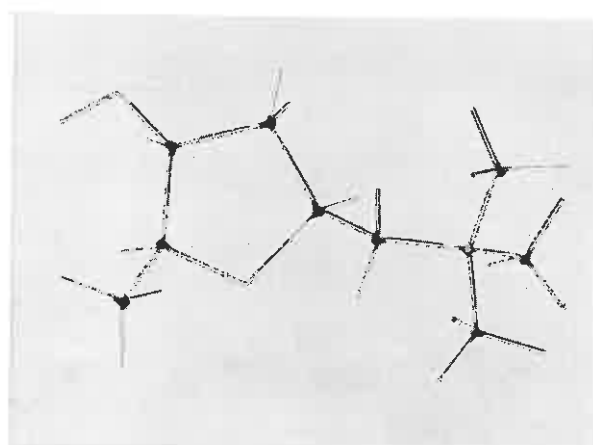
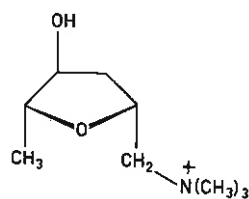
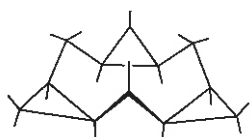
CYCLOOCTA - 1, 2, 5, 6 - TETRAEN -  
4, 8 - DION



1, 5, 7, 11 - TETRAHYDROXY - 6 - PHOSPHONIA -  
SPIRO [5.5] UNDECAN ION



HOMOBENZOL

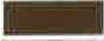
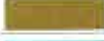


MUSKARIN

# Explications des marques colorées

Les unités possèdent des marques colorées caractérisant, soit la nature des éléments chimiques (a), soit la tension des angles de valence (b), soit les différents types de doubles liaisons (c), (voir la description des stéréomodèles, 3ème partie). Ces marques n'ont pas été imprimées en couleur dans les gravures des unités du catalogue mais sont représentées par des parties pointillées (à l'exception de l'atome de carbone) avec un symbole correspondant. Dans la colonne centrale (B) du tableau ci-dessous on a rassemblé les éléments représentés par les couleurs. Les couleurs symbolisant ces éléments sont reproduites dans la colonne de gauche (A) et les symboles associés aux couleurs dans la colonne de droite (C).

| A                                    | B                                     | C                              |
|--------------------------------------|---------------------------------------|--------------------------------|
| Marques colorées des diverses unités | Eléments représentés par les couleurs | Symboles associés aux couleurs |

|                |                                                                                     |           |                  |
|----------------|-------------------------------------------------------------------------------------|-----------|------------------|
| pas de couleur |    | Hydrogène | pas d'indication |
| noir           |    | Carbone   | noir             |
| vert foncé     |    | Arsenic   | As               |
| vert clair     |    | Bore      | B                |
| rouge brun     |    | Brome     | Br               |
| vert jaune     |    | Chlore    | Cl               |
| vert bleu      |    | Cobalt    | Co               |
| beige          |    | Fluor     | F                |
| jaune d'or     |   | Fer       | Fe               |
| brun foncé     |  | Jode      | I                |
| bleu clair     |  | Azote     | N                |
| bleu foncé     |  | Nickel    | Ni               |
| rouge          |  | Oxygène   | O                |
| violet         |  | Phosphore | P                |
| gris clair     |  | Plomb     | Pb               |
| jaune clair    |  | Soufre    | S                |
| argent         |  | Silicium  | Si               |
| gris foncé     |  | Etain     | Sn               |
| blanc          |  | Zinc      | Zn               |
| olive          |  | Sélénium  | Se               |
| bleu vert      |  | Magnésium | Mg               |
| gris brun      |  | Manganèse | Mn               |
| blanc bleuté   |  | Mercure   | Hg               |
| rouge foncé    |  | Cuivre    | Cu               |

| Tension des angles de valence |                                                                                     |                                                    |                              |
|-------------------------------|-------------------------------------------------------------------------------------|----------------------------------------------------|------------------------------|
| rose                          |  | groupe 4 (angles d'environ 90°)                    | 4                            |
| blanc                         |  | groupe 5 (angles de 103—108°)                      | 5                            |
| pas de couleur (éventl. noir) |  | groupe 6 (angles correspondant aux hybridisations) | pas d'indication (éventl. 6) |
| gris clair                    |  | groupe 7 (angles agrandis de 8—10°)                | 7                            |

| Types de doubles liaisons |                           |                  |
|---------------------------|---------------------------|------------------|
| une marque blanche        | double liaison isolée     | is               |
| deux marques blanches     | double liaison conjuguée  | con              |
| pas de marque             | double liaison aromatique | pas d'indication |