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Abkürzungsverzeichnis

9-dm	9-Demethylretinal
9-dm-JW5	9-Demethylretinal-Bacteriorhodopsin*
9-dm-Rho	9-Demethylretinal-Rhodopsin
9-Et	9-Ethylretinal
9-Et-JW5	9-Ethylretinal-Bacteriorhodopsin*
9-Et-Rho	9-Ethylretinal-Rhodopsin
9-Is	9-Isopropylretinal
9-Is-JW5	9-Isopropylretinal-Bacteriorhodopsin*
9-Is-Rho	9-Isopropylretinal-Rhodopsin
10-Me	10-Methylretinal
10-Me-JW5	10-Methylretinal-Bacteriorhodopsin*
10-Me-Rho	10-Methylretinal-Rhodopsin
13-dm	13-Demethylretinal
13-dm-JW5	13-Demethylretinal-Bacteriorhodopsin*
13-dm-Rho	13-Demethylretinal-Rhodopsin
abs.	absolut
AIBN	Azobisisobutyronitril
BB	Breitband (-Entkopplung von $^1\text{H}/^{13}\text{C}$ -Kopplungen)
ber.	berechnet
BO	Bacterioopsin
BR	Bacteriorhodopsin
cGMP	cyclisches GMP
DA	dunkeladaptiert
DBN	1,5-Diazabicyclo[4.3.0]non-5en
DBU	1,8-Diazabicyclo[5.4.0]undec-7en
DDM	Dodecyl- β -D-maltosid
DIBAH	Diisobutylaluminiumhydrid
DMAP	4-Dimethylaminopyridin
DTT	Dithiothreitol
EI	Elektronen-Stoß-Methode (Massenspektrometrie)
eq	Äquivalent(e)
FT-IR	Fourier transformation-infrared
<i>g</i> (kursiv)	vielfaches der Erdbeschleunigung (bei Zentrifugationen)
GDP	Guanosindiphosphat
gef.	gefunden
GMP	Guanosinmonophosphat
GTP	Guanosintriphosphat
HPLC	high performance (pressure) liquid chromatography
IR	infrared (Infrarot)
kD	kilo Dalton
LA	lichtadaptiert
LAD (LADS)	lifetime associated difference (spectra)
LDA	Lithiumdiisopropylamid

* aus der Assemblierung der Verbindung mit dem Bacterioopsin der Mutante JW5 des *Halobacterium salinarum*

LDAO	N,N-Dimethyldodecylamin-N-oxid
MD	10-Methyl-13-demethylretinal
MD-JW5	10-Methyl-13-demethylretinal-Bacteriorhodopsin *
MD-Rho	10-Methyl-13-demethylretinal-Rhodopsin
NBS	N-Bromsuccinimid
n-BuLi	n-Butyllithium
NMR	nuclear magnetic resonance (Kernresonanz)
PDE	Phosphodiesterase (PDE*, aktivierte Phosphodiesterase)
PIPES	1,4-Piperazin-bis-(ethansulfonsäure)
PMSF	Phenylmethansulfonylfluorid
PSB	protonierte Schiff-Base
Ret-JW5	mit Retinal assembliertes Bacteriorhodopsin
Ret-Rho	nach der Bleichung erneut mit 11Z-Retinal rekonstituiertes Rhodopsin
rpm	rotations per minute
SB	Schiff-Base
T	Transducin (T*, aktiviertes Transducin)
THF	Tetrahydrofuran
UV/Vis	Ultraviolett/ Visible
vaMD-JW5	vollständig assembliertes MD-JW5
w/v	weight/volume, Volumenprozent
w/w	weight/weight, Gewichtsprozent
WT	Wildtyp
ΔA	Absorptionsdifferenz
$\Delta\Delta A$	Differenz zur Absorptionsdifferenz (z. B. bei Residuen)
ϵ_{\max}	Extinktionskoeffizient am Absorptionsmaximum
λ_{exc}	Anregungswellenlänge
λ_{\max}	Absorptionsmaximum

Dreibuchstaben-Code für Aminosäuren

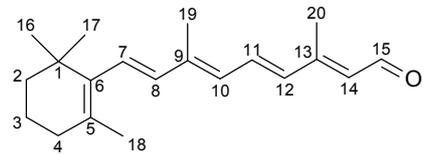
Ala	Alanin
Arg	Arginin
Asn	Asparagin
Asp	Aspartat
Cys	Cystein
Gln	Glutamin
Glu	Glutamat
Gly	Glycin
His	Histidin
Ile	Isoleucin
Leu	Leucin
Lys	Lysin
Met	Methionin
Phe	Phenylalanin
Pro	Prolin
Ser	Serin
Thr	Threonin
Trp	Tryptophan
Tyr	Tyrosin
Val	Valin

Substanzverzeichnis

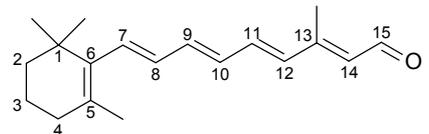
Bezifferung der Strukturen nach IUPAC-IUB,

Bezeichnung der Verbindungen entsprechend WHO

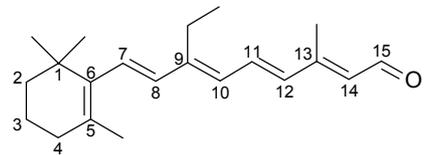
- 1** 3,7-Dimethyl-9-(2,6,6-trimethyl-1-cyclohexen-1-yl)-2,4,6,8-nonatetraenal, *Retinal*
(**1b** = [15-¹³C]-Retinal; **1c** = [14-¹³C]-Retinal)



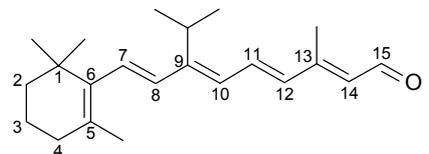
- 2** 3-Methyl-9-(2,6,6-trimethyl-1-cyclohexen-1-yl)-2,4,6,8-nonatetraenal, *9-Demethylretinal*, **9-dm**



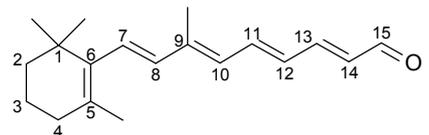
- 3** 7-Ethyl-3-methyl-9-(2,6,6-trimethyl-1-cyclohexen-1-yl)-2,4,6,8-nonatetraenal, *9-Ethylretinal*, **9-Et**



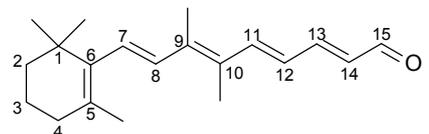
- 4** 7-(1-Methylethyl)-3-methyl-9-(2,6,6-trimethyl-1-cyclohexen-1-yl)-2,4,6,8-nonatetraenal, *9-Isopropylretinal*, **9-Is**



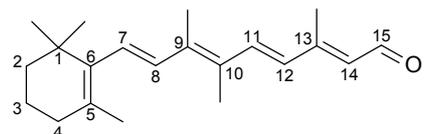
- 5** 7-Methyl-9-(2,6,6-trimethyl-1-cyclohexen-1-yl)-2,4,6,8-nonatetraenal, *13-Demethylretinal*, **13-dm**



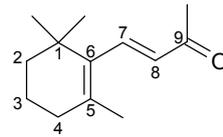
- 6** 6,7-Dimethyl-9-(2,6,6-trimethyl-1-cyclohexen-1-yl)-2,4,6,8-nonatetraenal, *10-Methyl-13-demethylretinal*, **MD**



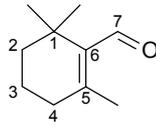
- 7** 3,6,7-Trimethyl-9-(2,6,6-trimethyl-1-cyclohexen-1-yl)-2,4,6,8-nonatetraenal, *10-Methylretinal*, **10-Me**



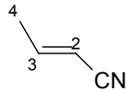
- 8 4-(2,6,6-Trimethyl-1-cyclohexen-1-yl)-3-buten-2-on, β -Ionon



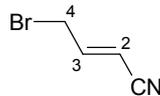
- 9 β -Cyclocitral



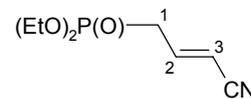
- 10 2-Butennitril



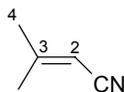
- 11 4-Brom-2-butennitril



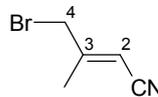
- 12 Diethyl-(3-cyano-2-propenyl)-phosphonat, C₄-Phosphonat



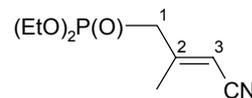
- 13 3-Methyl-2-butennitril



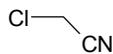
- 14 4-Brom-3-methyl-2-butennitril



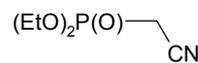
- 15 Diethyl-(3-cyano-2-methyl-2-propenyl)-phosphonat, C₅-Phosphonat



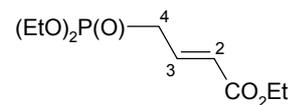
- 16 Chloracetonitril



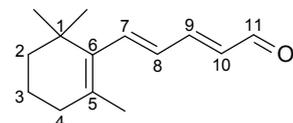
- 17 Diethylcyanmethylphosphonat, C₂-Phosphonat



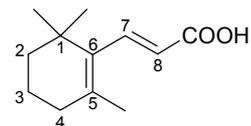
- 18 4-Diethylphosphono-3-methyl-2-butensäureethylester



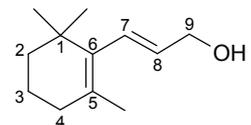
- 19 5-(2,6,6-Trimethyl-1-cyclohexen-1-yl)-2,4-pentadienal



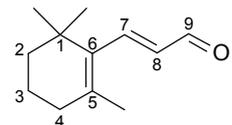
20 3-(2,6,6-Trimethyl-1-cyclohexen-1-yl)-2-propensäure



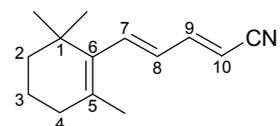
21 3-(2,6,6-Trimethyl-1-cyclohexen-1-yl)-2-propenol



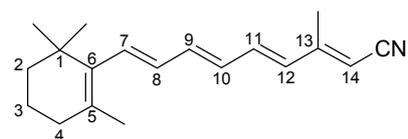
22 3-(2,6,6-Trimethyl-1-cyclohexen-1-yl)-propenal



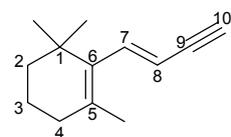
23 5-(2,6,6-Trimethyl-1-cyclohexen-1-yl)-2,4-pentadiennitril



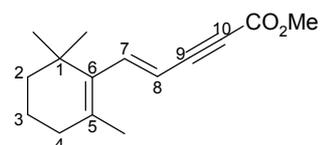
24 3-Methyl-(2,6,6-trimethyl-1-cyclohexen-1-yl)-2,4,6,8-nonatetraennitril



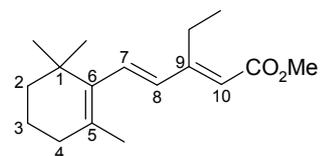
25 4-(2,6,6-Trimethyl-1-cyclohexen-1-yl)-but-3-en-1-in



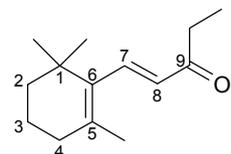
26 4-(2,6,6-Trimethyl-1-cyclohexen-1-yl)-pent-4-en-2-in-säuremethylester



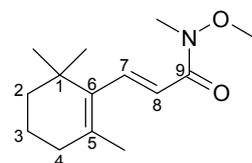
27 3-Ethyl-5-(2,6,6-trimethyl-1-cyclohexen-1-yl)-2,4-pentadiensäuremethylester



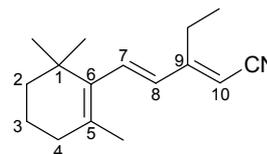
28 5-(2,6,6-Trimethyl-1-cyclohexen-1-yl)-4-penten-3-on



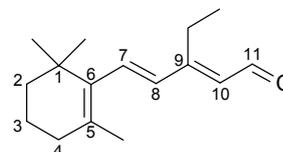
29 N-Methoxy-N-methyl-3-(2,6,6-trimethyl-1-cyclohexen-1-yl)-2-propenamid



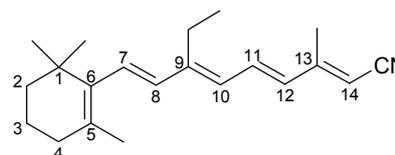
30 3-Ethyl-5-(2,6,6-trimethyl-1-cyclohexen-1-yl)-2,4-pentadiennitril



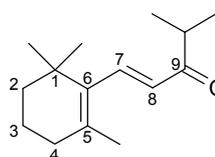
31 3-Ethyl-5-(2,6,6-trimethyl-1-cyclohexen-1-yl)-2,4-pentadienal



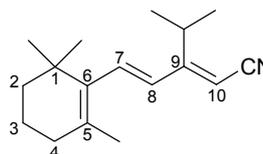
32 7-Ethyl-3-methyl-9-(2,6,6-trimethyl-1-cyclohexen-1-yl)-2,4,6,8-nonatetraennitril



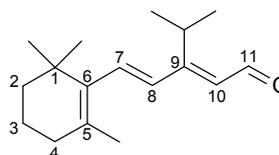
33 2-Methyl-5-(2,6,6-trimethyl-1-cyclohexen-1-yl)-4-penten-3-on



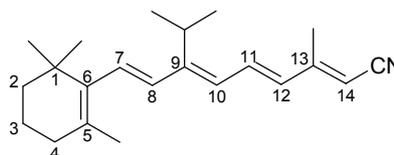
34 3-(1-Methylethyl)-5-(2,6,6-trimethyl-1-cyclohexen-1-yl)-2,4-pentadiennitril

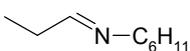


35 3-(1-Methylethyl)-5-(2,6,6-trimethyl-1-cyclohexen-1-yl)-2,4-pentadienal

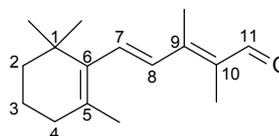


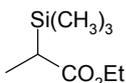
36 7-(1-Methylethyl)-3-methyl-9-(2,6,6-trimethyl-1-cyclohexen-1-yl)-2,4,6,8-nonatetraennitril

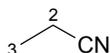


37 N-Cyclohexyl-1-propanimin 

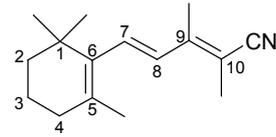
38 2,3-Dimethyl-5-(2,6,6-trimethyl-1-cyclohexen-1-yl)-2,4-pentadienal, C₁₆-Aldehyd



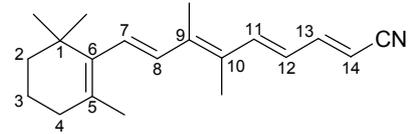
39 2-(Trimethylsilyl)-propansäureethylester 

40 Propannitril 

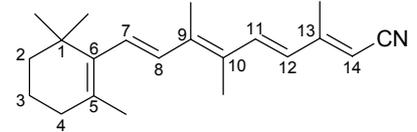
- 41** 2,3-Dimethyl-5-(2,6,6-trimethyl-1-cyclohexen-1-yl)-2,4-pentadiennitril, C₁₆-Nitril



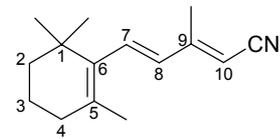
- 42** 6,7-Dimethyl-9-(2,6,6-trimethyl-1-cyclohexen-1-yl)-2,4,6,8-nonatetraennitril



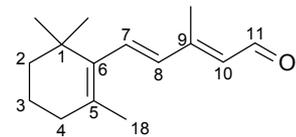
- 43** 3,6,7-Trimethyl-9-(2,6,6-trimethyl-1-cyclohexen-1-yl)-2,4,6,8-nonatetraennitril



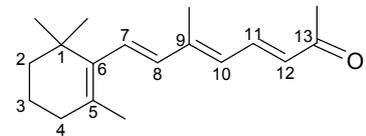
- 44** 3-Methyl-5-(2,6,6-trimethyl-1-cyclohexen-1-yl)-2,4-pentadiennitril



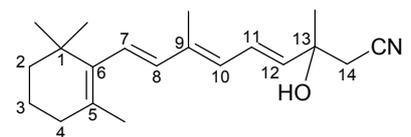
- 45** 3-Methyl-5-(2,6,6-trimethyl-1-cyclohexen-1-yl)-2,4-pentadienal, C₁₅-Aldehyd



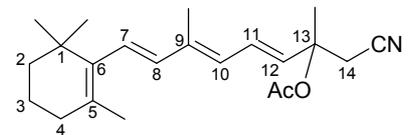
- 46** 6-Methyl-8-(2,6,6-trimethyl-1-cyclohexen-1-yl)-3,5,7-octatrien-2-on, C₁₈-Keton



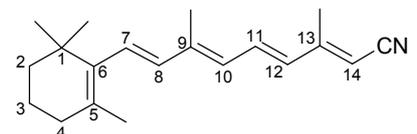
- 47** 3,7-Dimethyl-3-hydroxy-9-(2,6,6-trimethyl-1-cyclohexen-1-yl)-4,6,8-nonatriennitril



- 48** 3-Acetoxy-3,7-dimethyl-9-(2,6,6-trimethyl-1-cyclohexen-1-yl)-4,6,8-nonatriennitril



- 49** 3,7-Dimethyl-9-(2,6,6-trimethyl-1-cyclohexen-1-yl)-2,4,6,8-nonatetraennitril



- 50** 3,7-Dimethyl-9-(2,6,6-trimethyl-1-cyclohexen-1-yl)-2,4,6,8-nonatetraen-1-ol, Retinol

