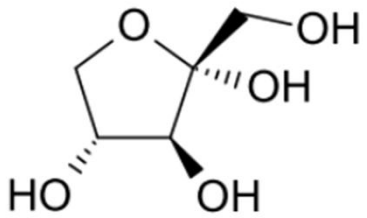
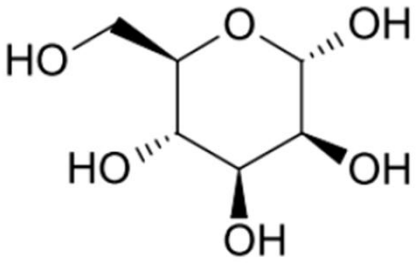
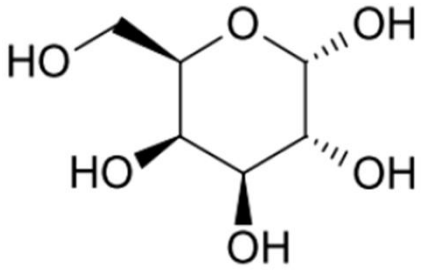


Xylose



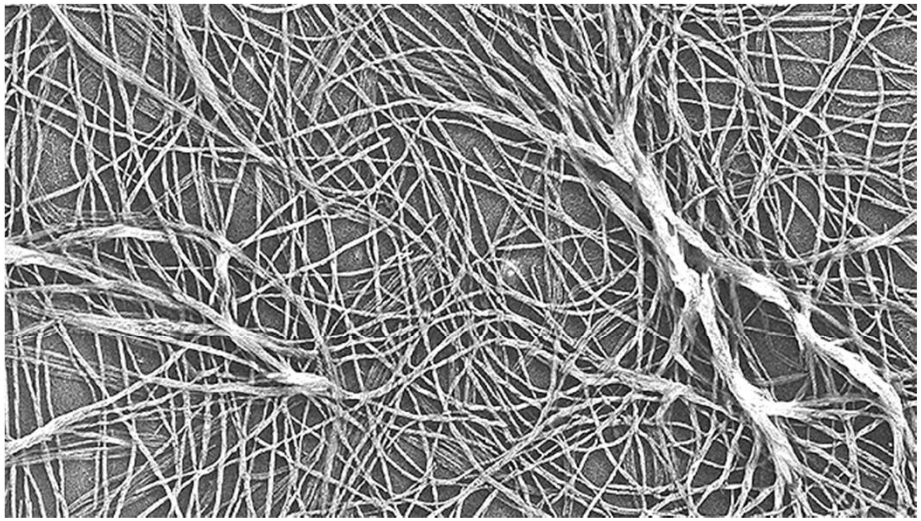
Mannose



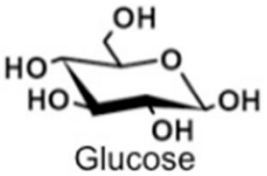
Galaktose

Zucker im Boden

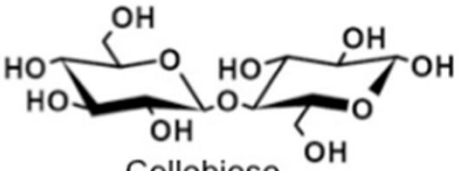
Zellulose



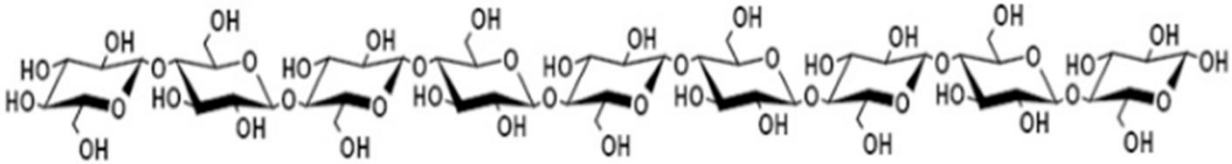
β-(1-4) Glukosepolymer



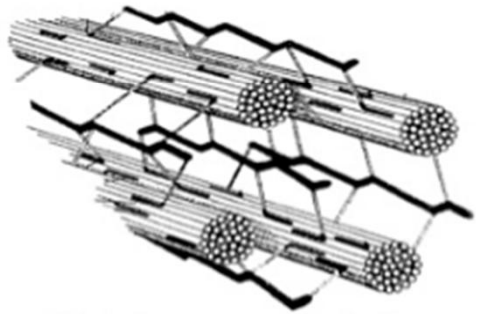
Glucose



Cellobiose

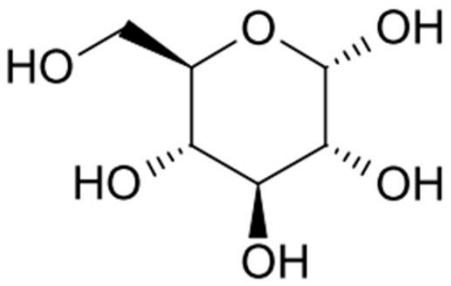


Cellulose chains can exceed 10,000 monomer units



36 chains associate to form
microfibrils that stabilize the cell wall

Hemizellulose



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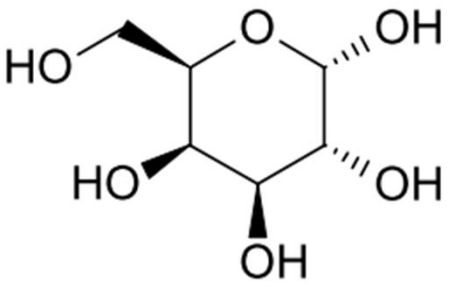
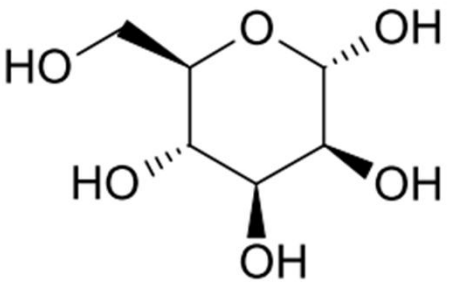
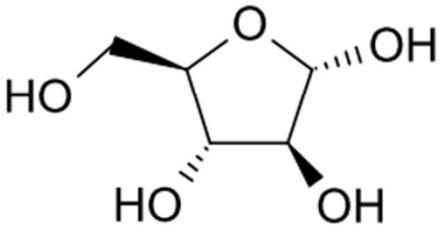


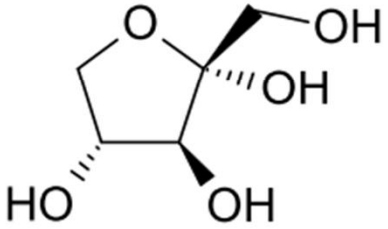
Galaktose



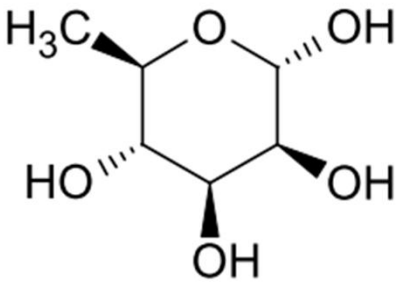
Mannose



Arabinose

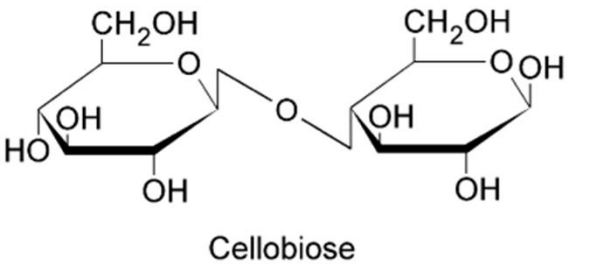


Xylose

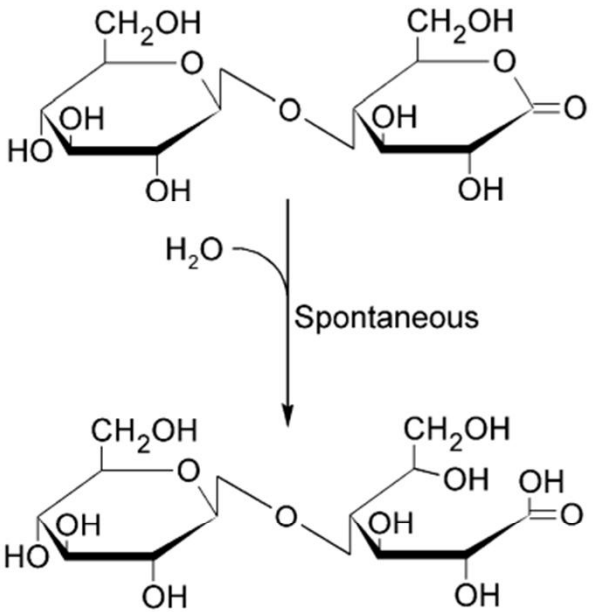


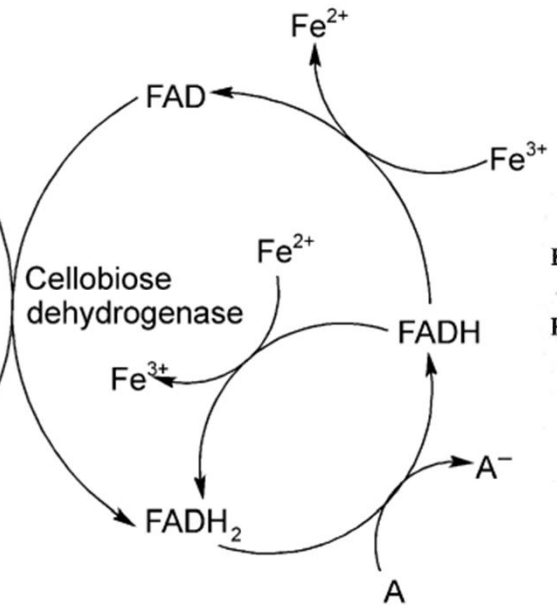
Rhamnose

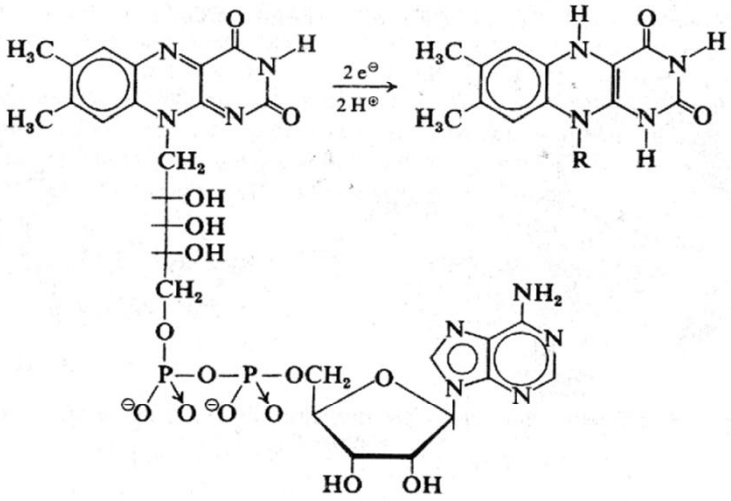
Abbau von Zellulose



Cellobiose







FAD, Flavin adenine dinucleotide, oxidized and reduced forms

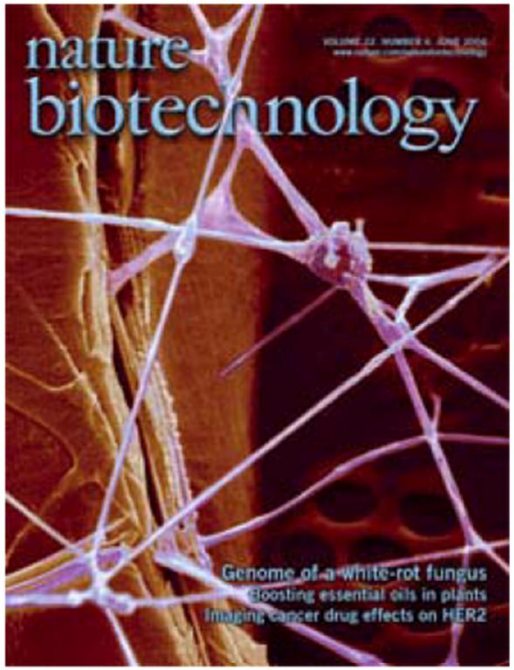
Part of the degradation of lignin is carried out through non-enzymatic processes. In one of these, the so-called hydroxyl radical plays an important part. Although not all steps in lignin degradation are understood, we mention the concept here.

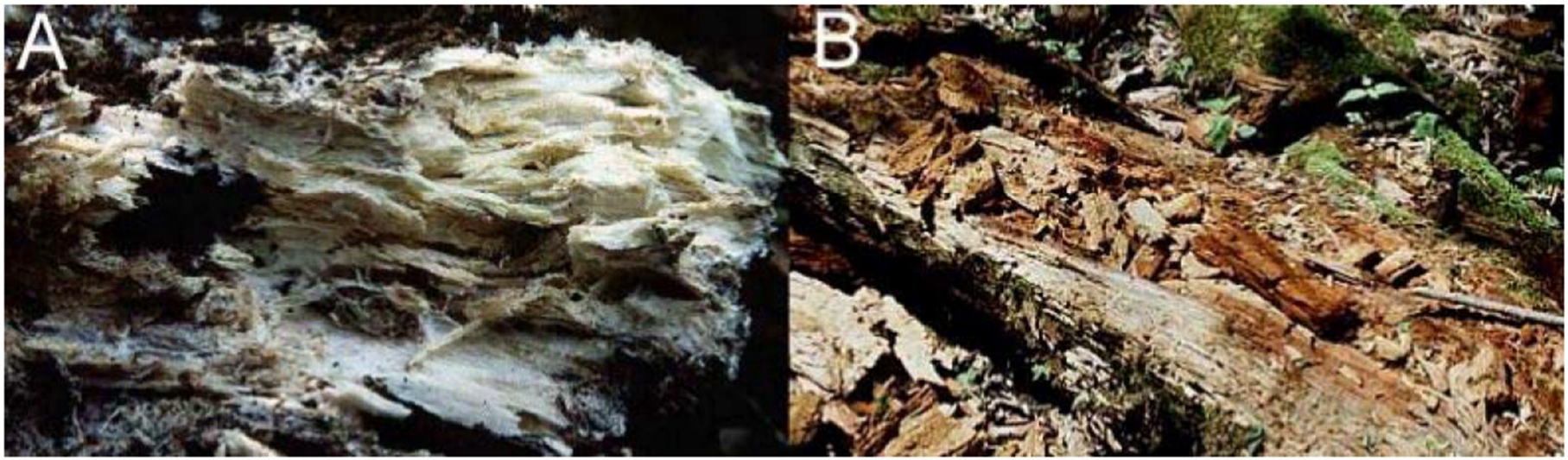
When oxygen is reduced, hydrogen peroxide is formed, which in its turn is split in a reaction. Below we have given a general chemical reaction. So far it is not known how fungi carry out the reaction.

$$Fe^{2+} + H_2O_2 \rightarrow Fe^{3+} + OH^- + {}^{\bullet}OH$$

It seems clear, though, that the highly mobile radical ($^{\bullet}OH$) is produced by fungal enzymes, among others, a cellobiase oxidase and laccase. Hydroxyl radicals may cause an oxidation of lignin to quinines.

Weißfäulepilze (*Phanerochaete chrysosporium*)





Braunfäulepilze (*Ganoderma lucidum*)

Chinonredoxkreisläufe

Fenton Reaktion

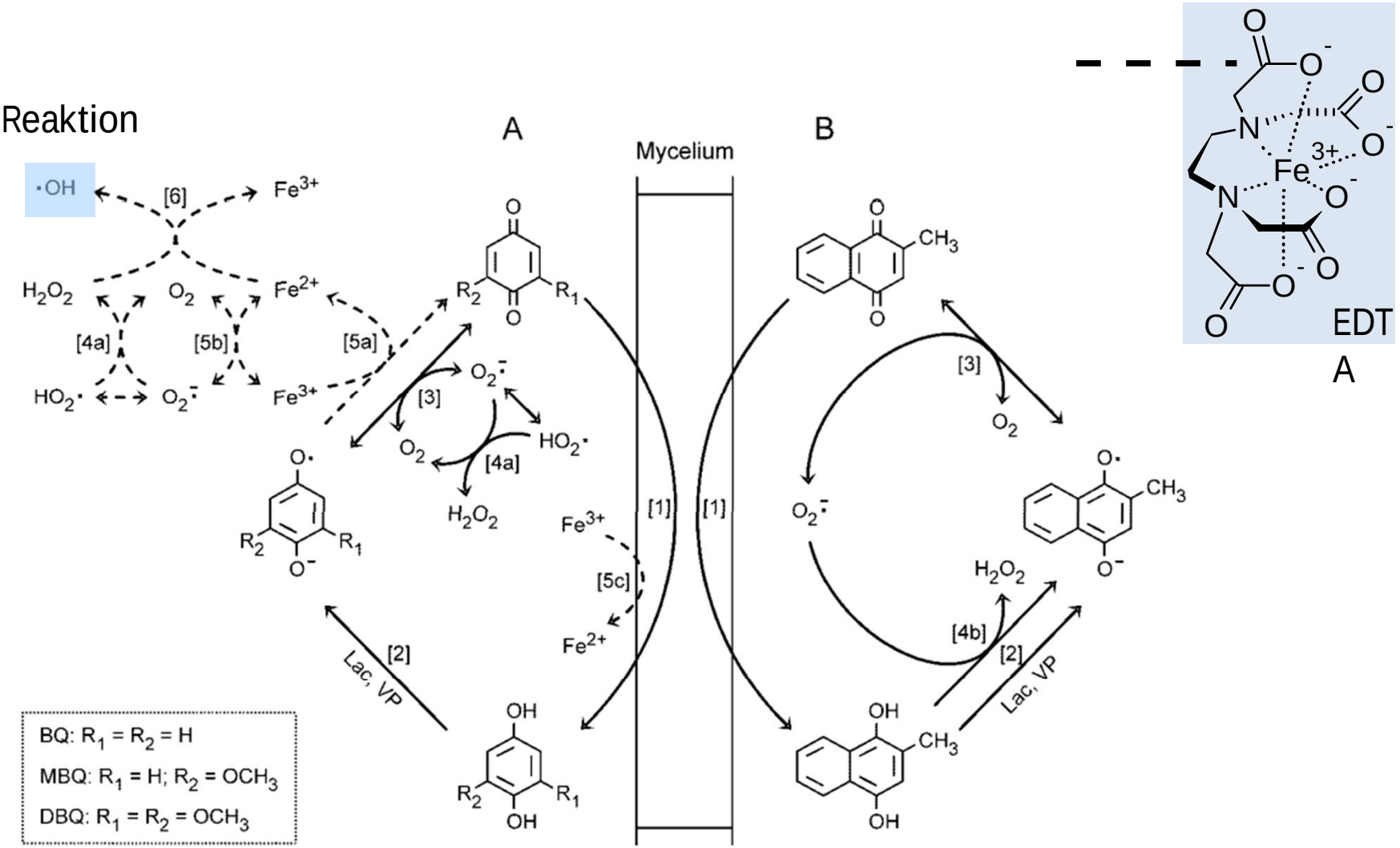
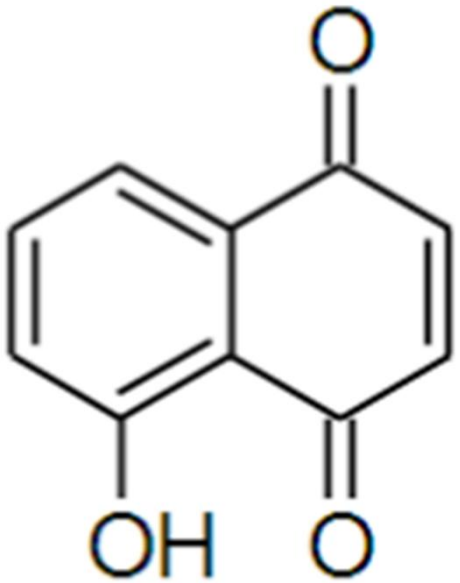


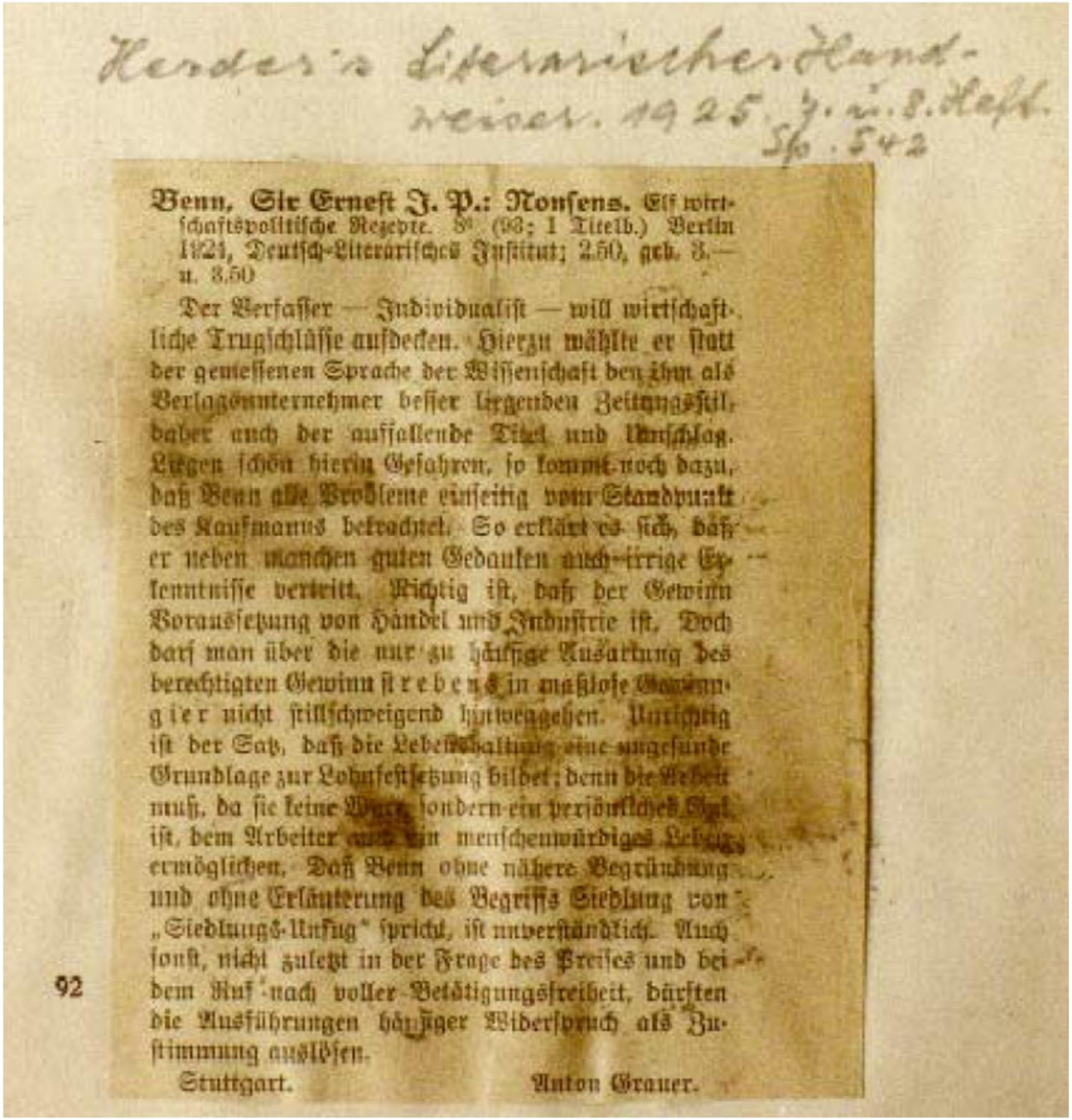
FIG. 8. Scheme of the quinone redox cycling process in *P. eryngii* (see Discussion for an explanation). (A) Main reactions involved in ROS production through BQ, MBQ, and DBQ redox cycling in the absence and presence of Fe^{3+}-EDTA (solid and dashed arrows, respectively). (B) MD redox cycling, showing hydroquinone propagation by $O_2^{\cdot -}$. Reversible reactions are indicated by double arrows.

Nussschnaps



Juglon

Stockflecken auf Papier



Herder's Literarischer Handweiser. 1925. 7. u. 8. Heft. Sp. 542

Benn, Sir Ernest J. P.: Nonsens. Elf wirtschaftspolitische Rezepte. 8° (93; 1 Titelb.) Berlin 1924, Deutsch-Literarisches Institut; 2.50, geb. 3.— u. 3.50

Der Verfasser — Individualist — will wirtschaftliche Trugschlüsse aufdecken. Hierzu wählte er statt der gemessenen Sprache der Wissenschaft den ihm als Verlagsunternehmer besser liegenden Zeitungsstil, dabei auch der auffallende Titel und Umschlag. Liegen schon hierin Gefahren, so kommt noch dazu, daß Benn alle Probleme einseitig vom Standpunkt des Kaufmanns betrachtet. So erklärt es sich, daß er neben manchen guten Gedanken auch irrige Erkenntnisse vertritt. Richtig ist, daß der Gewinn Voraussetzung von Handel und Industrie ist. Doch darf man über die nur zu häufige Ausartung des berechtigten Gewinnstrebens in maßlose Gewinngier nicht stillschweigend hinweggehen. Unrichtig ist der Satz, daß die Lebenshaltung eine ungesunde Grundlage zur Lohnfestsetzung bildet; denn die Arbeit muß, da sie keine Ware, sondern ein persönliches Gut ist, dem Arbeiter auch ein menschenwürdiges Leben ermöglichen. Daß Benn ohne nähere Begründung und ohne Erläuterung des Begriffs Siedlung von „Siedlungs-Unfug" spricht, ist unverständlich. Auch sonst, nicht zuletzt in der Frage des Preises und bei dem Ruf nach voller Betätigungsfreiheit, dürften die Ausführungen häufiger Widerspruch als Zustimmung auslösen.

Stuttgart. Anton Grauer.

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Bakterieller Ligninabbau zu Pyruvat und Oxalacetat

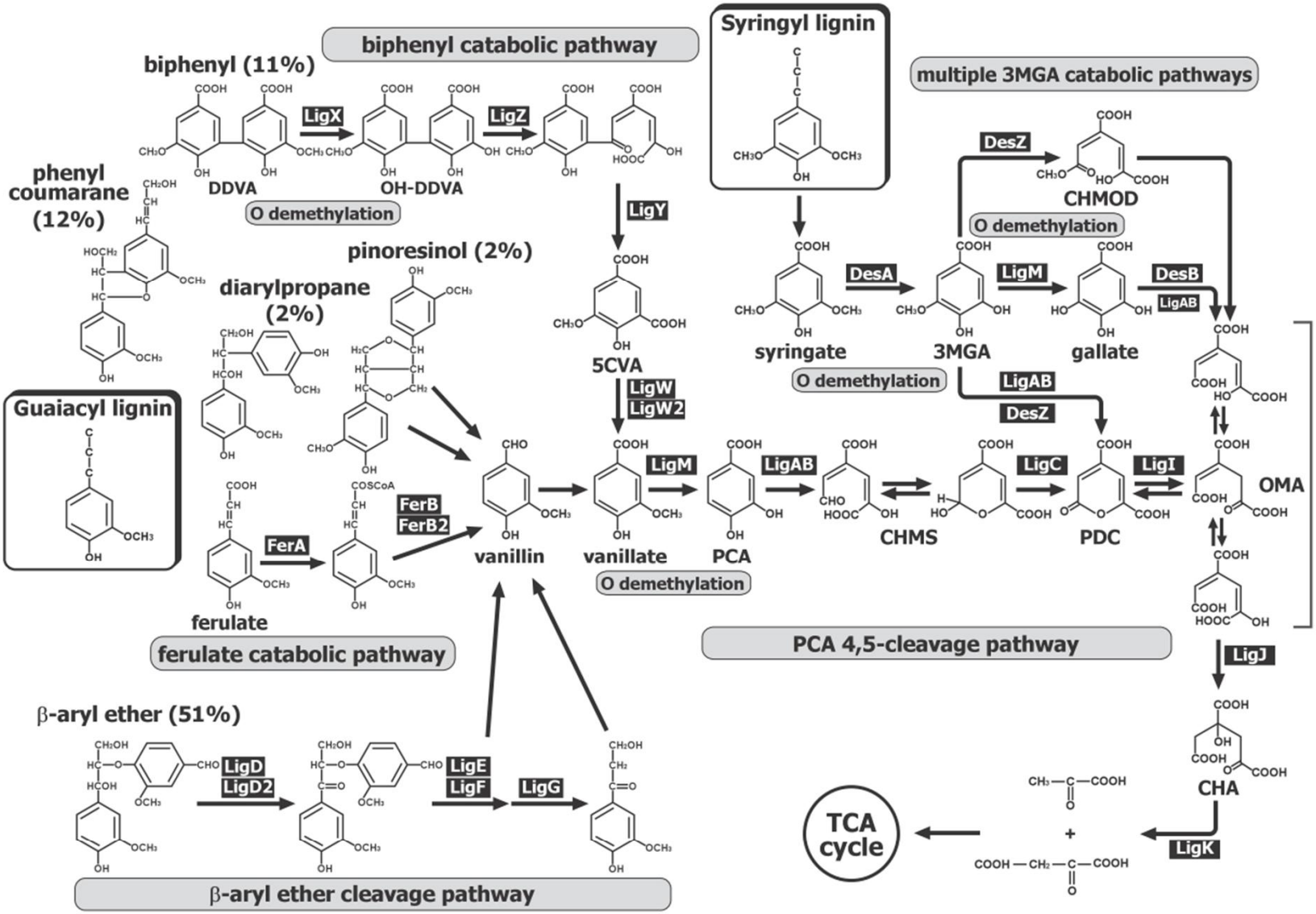
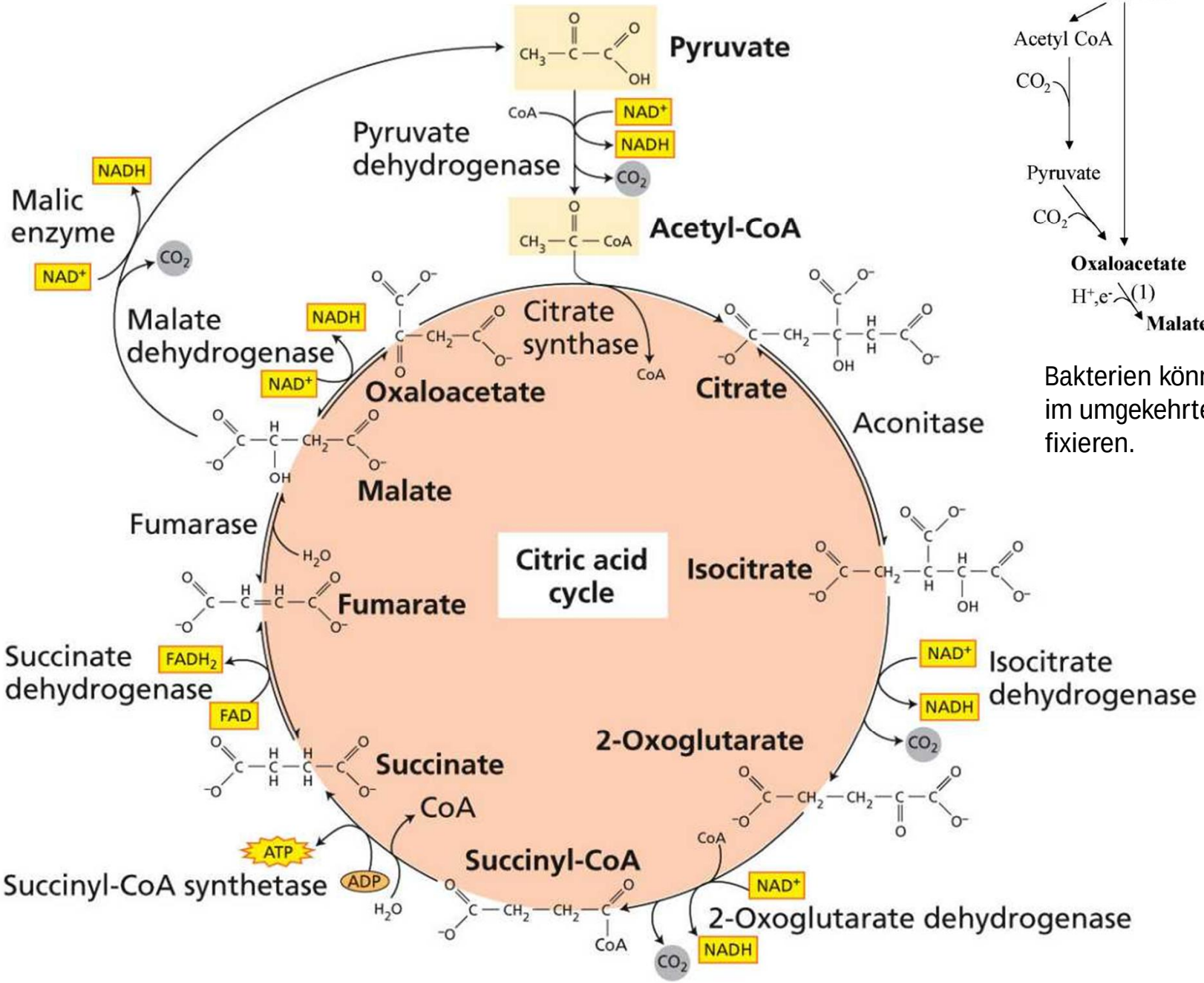
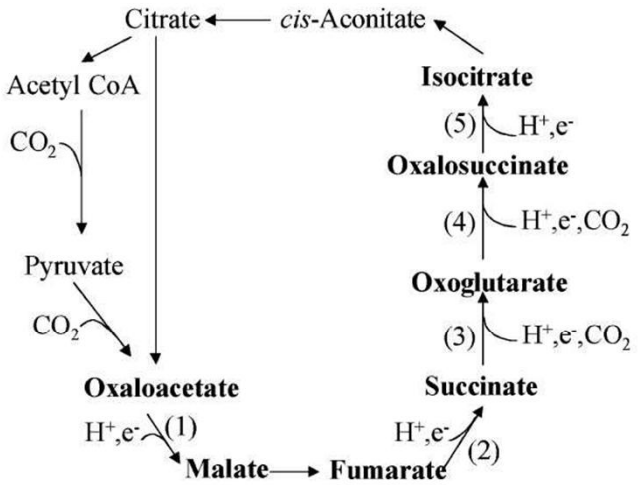


Fig. 1. Catabolic Pathways for the Degradation of Lignin-Derived Aromatic Compounds by *S. paucimobilis* SYK-6.

SYK-6 is able to grow on various lignin-derived biaryls and monoaryls *via* the PCA 4,5-cleavage pathway and the multiple 3MGA catabolic pathways. The percentages are the ratios of the intermonomer linkages in native lignin.[101] *Abbreviations*: DDVA, 5,5′-dehydrodivanillate; OH-DDVA, 2,2′,3-trihydroxy-3′-methoxy-5,5′-dicarboxybiphenyl; 5CVA, 5-carboxyvanillate; PCA, protocatechuate; CHMS, 4-carboxy-2-hydroxymuconate-6-semialdehyde; PDC, 2-pyrone-4,6-dicarboxylate; OMA, 4-oxalomesaconate; CHA, 4-carboxy-4-hydroxy-2-oxoadipate; 3MGA, 3-*O*-methylgallate; CHMOD, 4-carboxy-2-hydroxy-6-methoxy-6-oxohexa-2,4-dienoate; TCA, tricarboxylic acid.

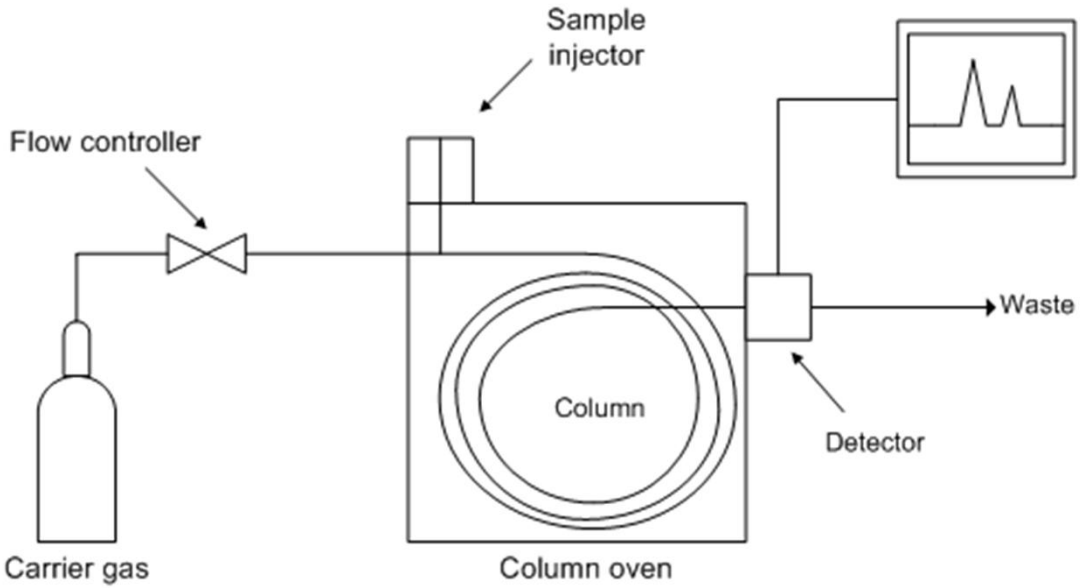
Zitronensäure Zyklus





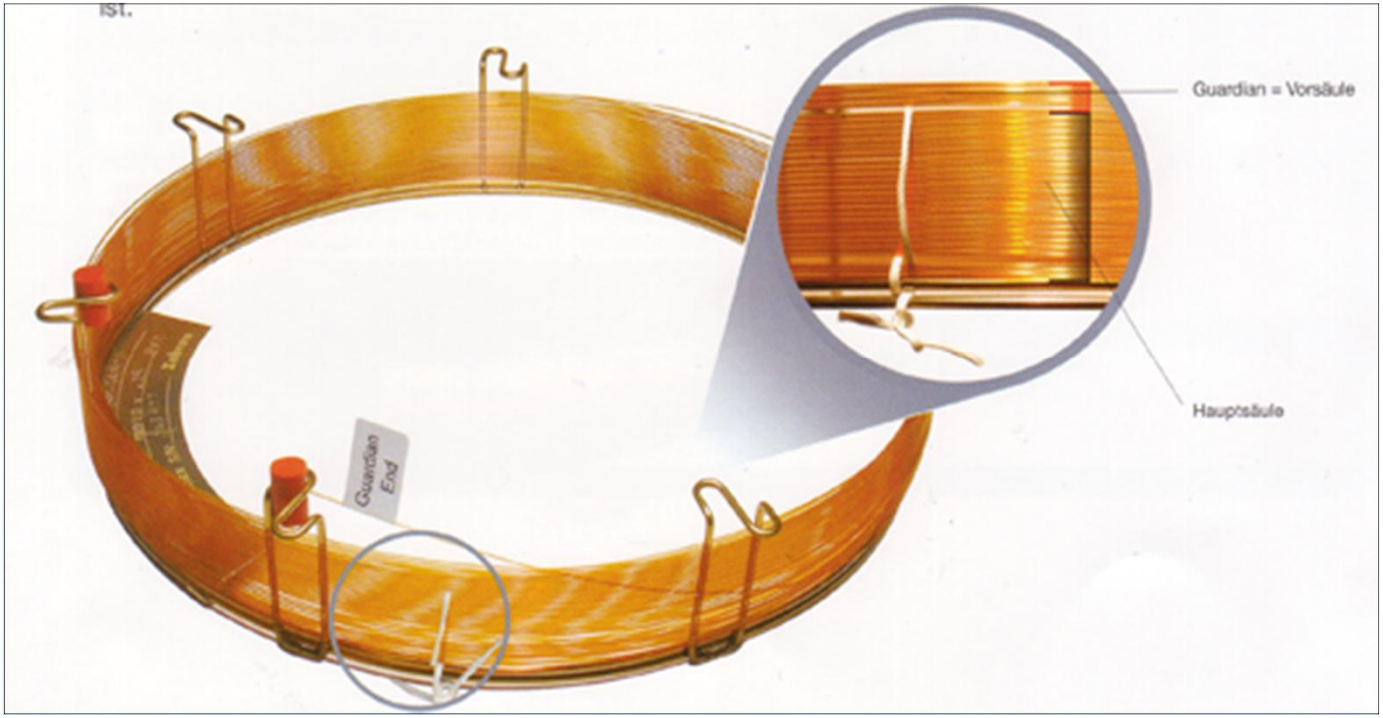
Bakterien können Kohlendioxid im umgekehrten Zitronensäurezyklus fixieren.

Gas Chromatographie (GC)



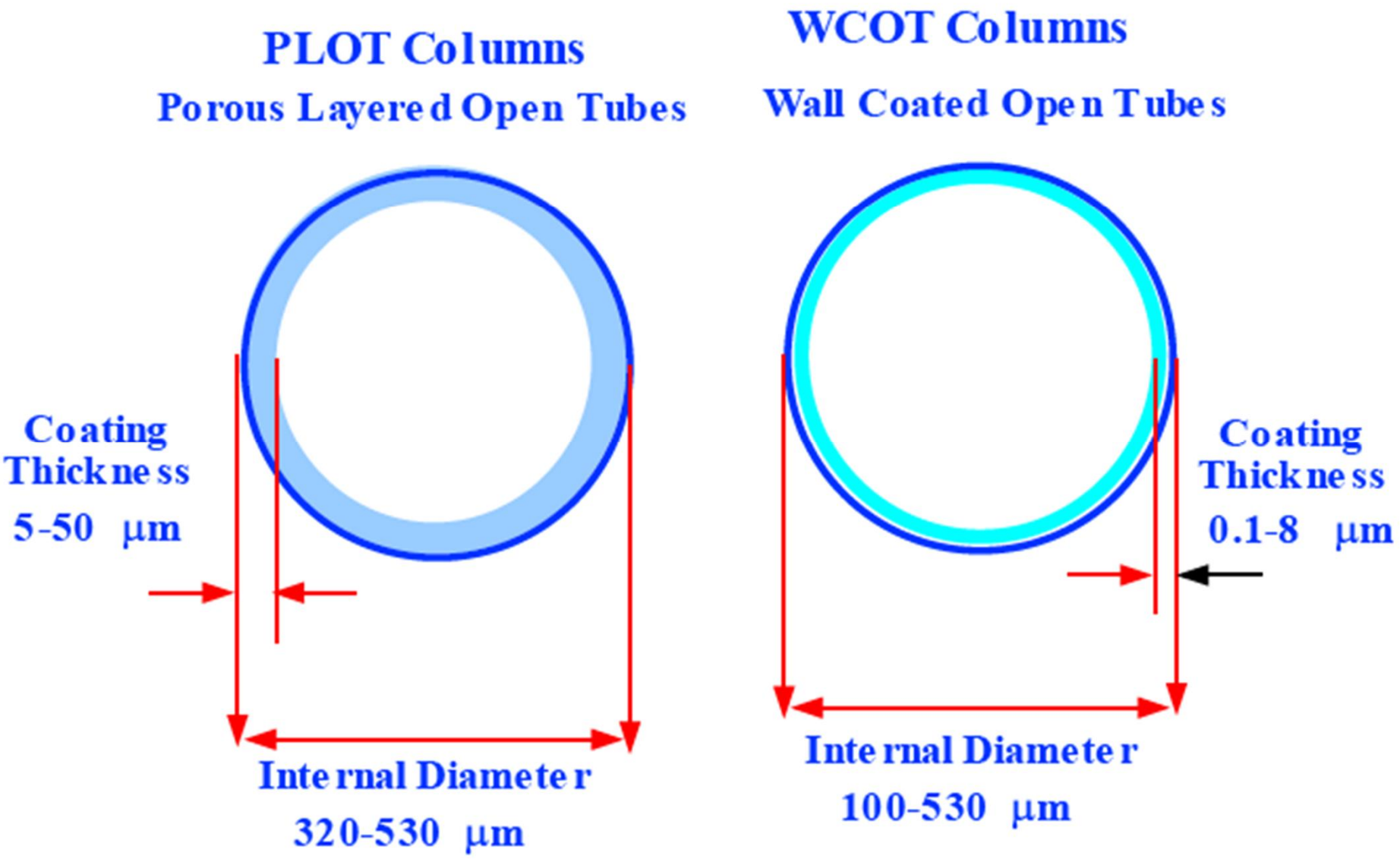
GC Säulen

Gepackte Säule

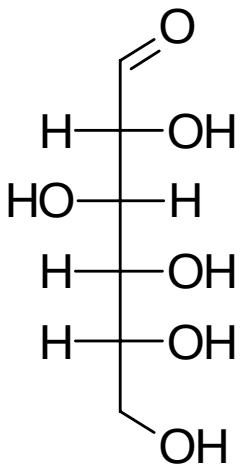


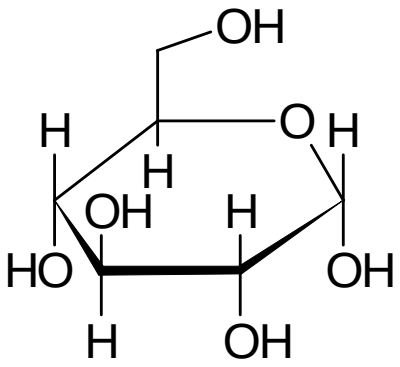
Quarzkapillarsäule

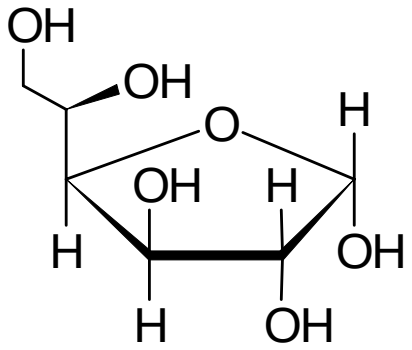
Kapillarsäulen

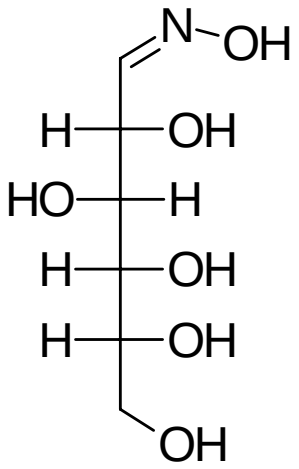


Derivatisierung der Analyten: Oximierung



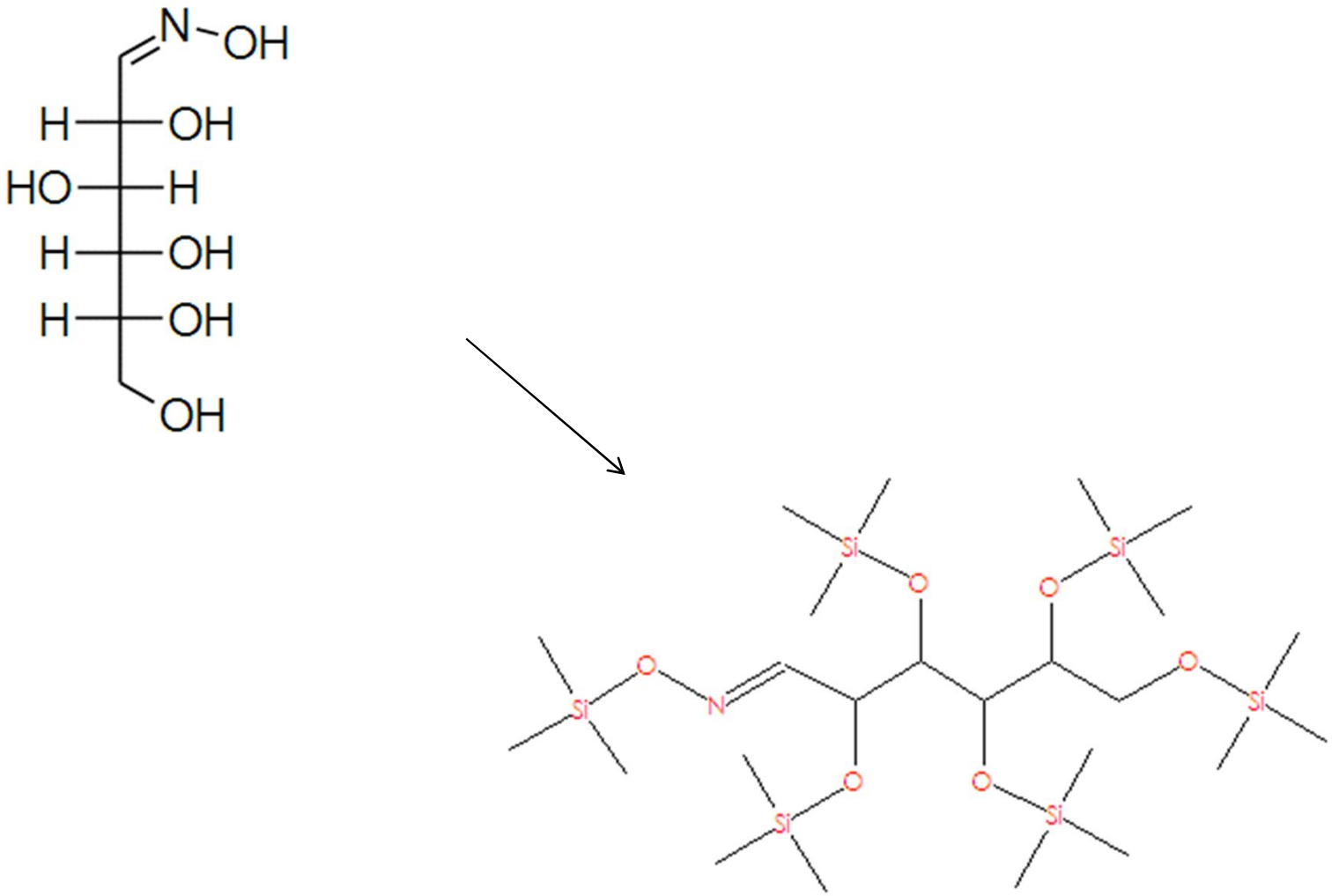




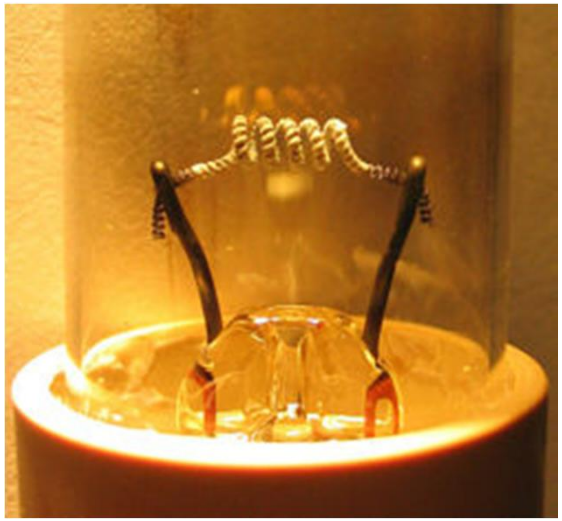


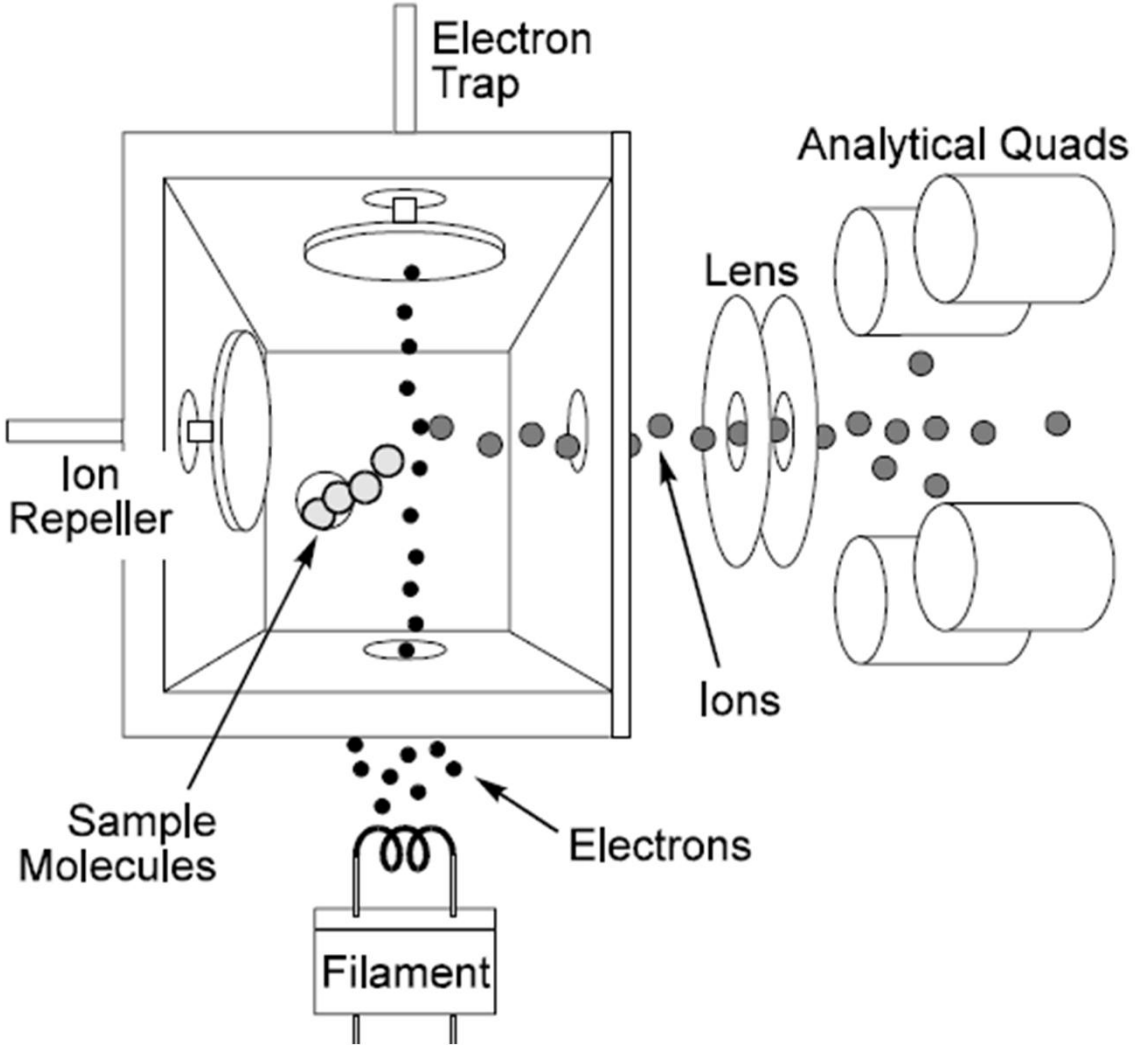
Oximierung reduziert die Anzahl der bei GC Trennungen erhaltenen Peaks.

Derivatisierung der Analyten: Silylierung



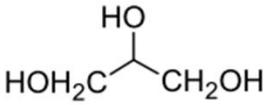
Elektronenstoß Ionisierung





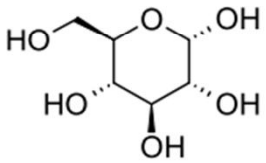
$$M + e^- \rightarrow M^{+\bullet} + 2e^-$$

Biomarker im Boden

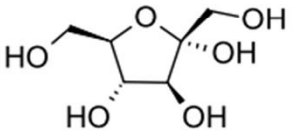


Glycerin

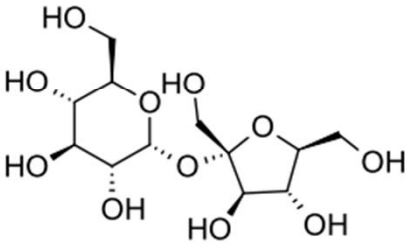
Bakterien



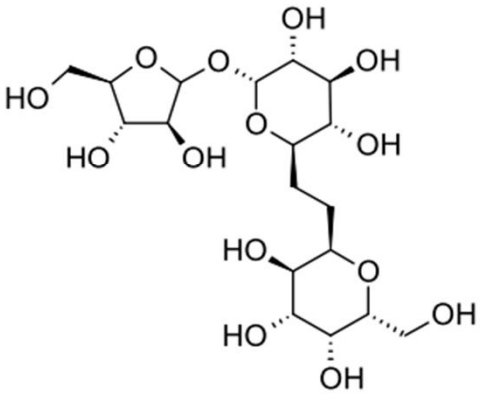
Glucose



Fructose

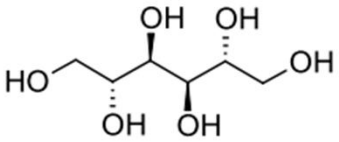


Saccharose

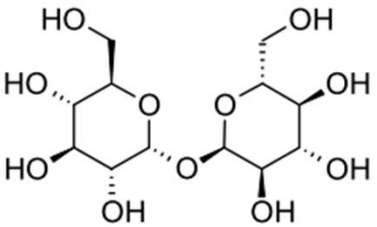


Raffinose

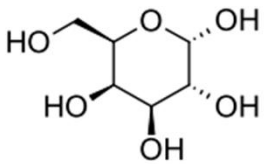
Pflanzen



Mannitol



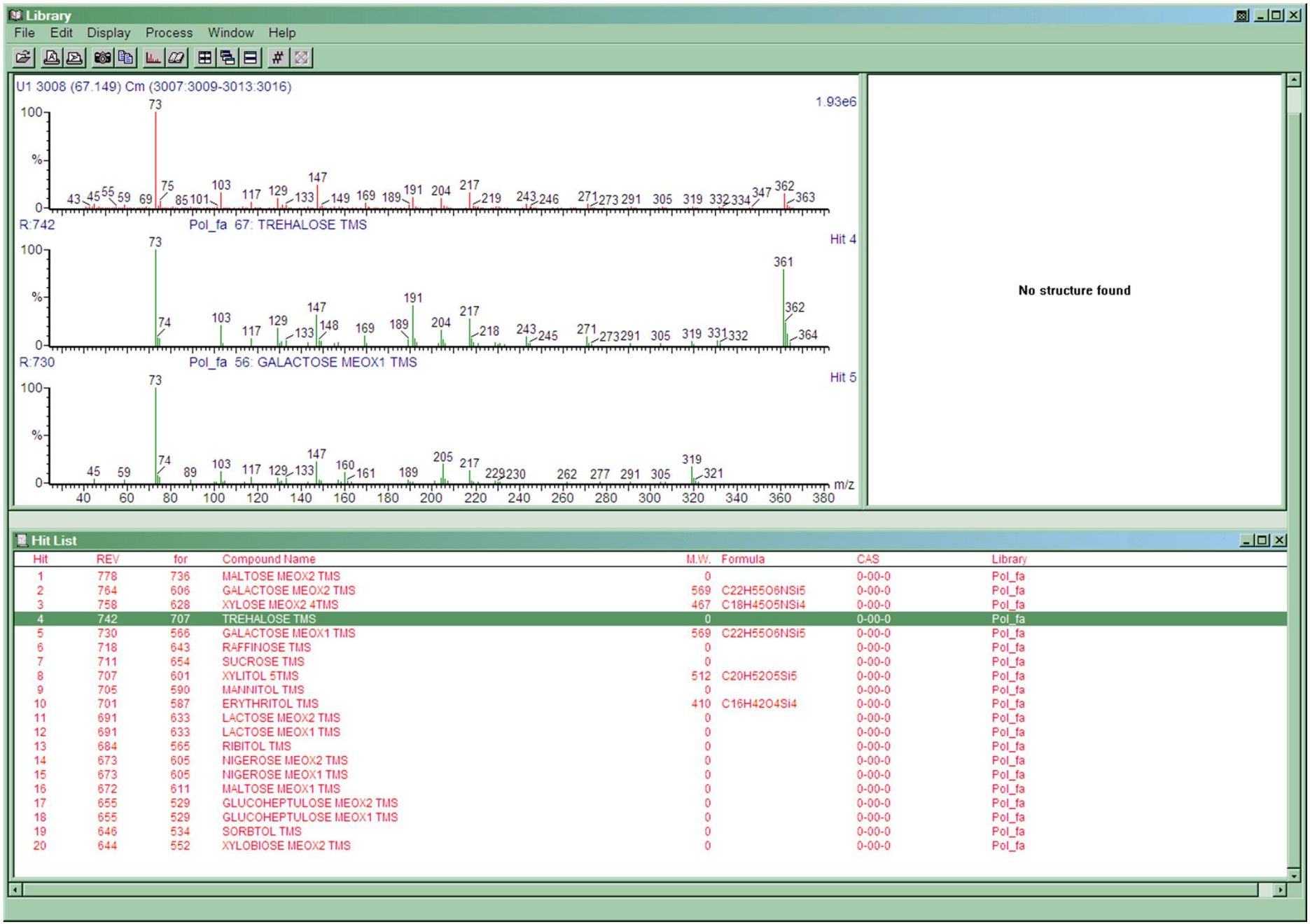
Trehalose



Galaktose

Pilze

Strukturaufklärung: Vergleichsdatenbanken



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2	764	606	GALACTOSE MEOX2 TMS	569	C22H55O6NSi5	0-00-0	Pol_fa
3	758	628	XYLOSE MEOX2 4TMS	467	C18H45O5NSi4	0-00-0	Pol_fa
4	742	707	TREHALOSE TMS	0		0-00-0	Pol_fa
5	730	566	GALACTOSE MEOX1 TMS	569	C22H55O6NSi5	0-00-0	Pol_fa
6	718	643	RAFFINOSE TMS	0		0-00-0	Pol_fa
7	711	654	SUCROSE TMS	0		0-00-0	Pol_fa
8	707	601	XYLITOL 5TMS	512	C20H52O5Si5	0-00-0	Pol_fa
9	705	590	MANNITOL TMS	0		0-00-0	Pol_fa
10	701	587	ERYTHRITOL TMS	410	C16H42O4Si4	0-00-0	Pol_fa
11	691	633	LACTOSE MEOX2 TMS	0		0-00-0	Pol_fa
12	691	633	LACTOSE MEOX1 TMS	0		0-00-0	Pol_fa
13	684	565	RIBITOL TMS	0		0-00-0	Pol_fa
14	673	605	NIGEROSE MEOX2 TMS	0		0-00-0	Pol_fa
15	673	605	NIGEROSE MEOX1 TMS	0		0-00-0	Pol_fa
16	672	611	MALTOSE MEOX1 TMS	0		0-00-0	Pol_fa
17	655	529	GLUCOHEPTULOSE MEOX2 TMS	0		0-00-0	Pol_fa
18	655	529	GLUCOHEPTULOSE MEOX1 TMS	0		0-00-0	Pol_fa
19	646	534	SORBTOL TMS	0		0-00-0	Pol_fa
20	644	552	XYLOBIOSE MEOX2 TMS	0		0-00-0	Pol_fa

Strukturaufklärung: Retentionszeiten

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Datei Bearbeiten Ansicht Einfügen Format Extras Daten Fenster Hilfe

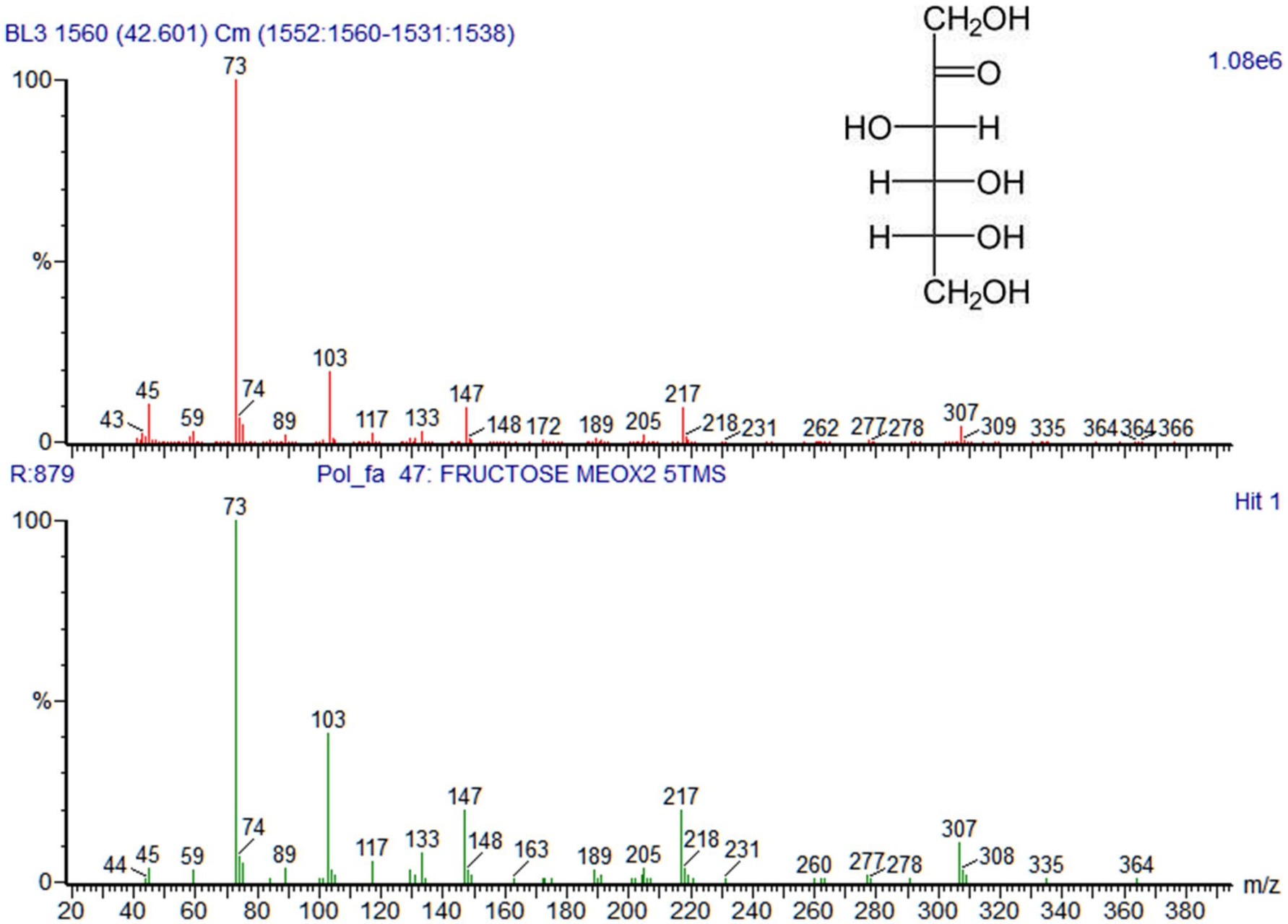
B1:B65536 | 1873

	A	B	C	D	E	F	G	H	I	J	
864	186008	1873,0	3035BB03	M[2]	Q_MSRI_ID	Sorbose methoxyamine (5TMS)	identified	ambient δ 12C	SD		
865	186009	1857,3	3184BF06	M[2]	Q_MSRI_ID	3,5-Dimethoxycinnamic acid {BP} (1TMS)	identified	ambient δ 12C	SD		Standard
866	187001	1871,1	3161BN33	M[2]	Q_MSRI_ID	L-Asparagine (4TMS)	identified	ambient δ 12C	ATH	L	*Arabidopsis thaliana* ec
867	187001	1870,8	1135EC44	M[1]	T_MSRI_ID	L-Asparagine (4TMS)	identified	ambient δ 12C	ATH	R	*Arabidopsis thaliana* ec
868	187001	1871,6	1164EK04	M[1]	T_MSRI_ID	L-Asparagine (4TMS)	identified	ambient δ 12C	SD		Standard
869	187001	1871,4	1179EK03	M[1]	T_MSRI_ID	L-Asparagine (4TMS)	identified	ambient δ 12C	SD		Standard
870	187002	1873,3	3161BN21	M[2]	Q_MSRI_ID	Fructose methoxyamine (5TMS)	identified	ambient δ 12C	ATH	L	*Arabidopsis thaliana* ec
871	187002	1865,8	1135EC44	M[1]	T_MSRI_ID	Fructose methoxyamine (5TMS)	identified	ambient δ 12C	ATH	R	*Arabidopsis thaliana* ec
872	187002	1866,7	1185EK18	M[1]	T_MSRI_ID	Fructose methoxyamine (5TMS)	identified	ambient δ 12C	SD		Standard
873	187002	1866,1	1135EC00	M[1]	T_MSRI_ID	Fructose methoxyamine (5TMS)	identified	ambient δ 12C	SD		Standard
874	187002	1874,5	2236BN30	M[2]	Q_MSRI_ID	Fructose methoxyamine (5TMS)	identified	ambient δ 12C	LJA	LD	*Lotus japonicus* (Regel
875	187002	1877,1	2236BN50	M[2]	Q_MSRI_ID	Fructose methoxyamine (5TMS)	identified	ambient δ 12C	LJA	F	*Lotus japonicus* (Regel
876	187002	1875,9	2236BN14	M[2]	Q_MSRI_ID	Fructose methoxyamine (5TMS)	identified	ambient δ 12C	LJA	RL	*Lotus japonicus* (Regel
877	187002	1871,7	2236BN40	M[2]	Q_MSRI_ID	Fructose methoxyamine (5TMS)	identified	ambient δ 12C	LJA	LM	*Lotus japonicus* (Regel
878	187002	1874,5	2236BN40	M[2]	Q_MSRI_ID	Fructose methoxyamine (5TMS)	identified	ambient δ 12C	LJA	LM	*Lotus japonicus* (Regel
879	187002	1875,0	2236BN20	M[2]	Q_MSRI_ID	Fructose methoxyamine (5TMS)	identified	ambient δ 12C	LJA	RP	*Lotus japonicus* (Regel
880	187002	1875,7	1267BK12	M[2]	Q_MSRI_ID	Fructose methoxyamine (5TMS)	identified	ambient δ 12C	SD		
881	187003	1869,2	1344EC16	M[1]	T_MSRI_ID	2-Ketogluconic acid methoxyamine (5TMS)	identified	ambient δ 12C	SD		Standard
882	187005	1871,9	1135EC44	M[1]	T_MSRI_ID			ambient δ 12C	ATH	R	*Arabidopsis thaliana* ec
883	187006	1865,9	1267BK12	M[2]	Q_MSRI_ID	[911; O-Methyl-inositol (5TMS)]	matched	ambient δ 12C	NID		
884	187006	1865,4	2236BN20	M[2]	Q_MSRI_ID	[923; O-Methyl-inositol (5TMS)]	matched	ambient δ 12C	LJA	RP	*Lotus japonicus* (Regel
885	187007	1870,1	1135EC00	M[1]	T_MSRI_ID	Sorbose methoxyamine {BP} (5TMS)	identified	ambient δ 12C	SD		Standard
886	187007	1878,2	3035BB03	M[2]	Q_MSRI_ID	Sorbose methoxyamine {BP} (5TMS)	identified	ambient δ 12C	SD		
887	187008	1873,3	1135EC00	M[1]	T_MSRI_ID	Allose methoxyamine (5TMS)	identified	ambient δ 12C	SD		Standard
888	187009	1872,8	3233BF05	M[2]	Q_MSRI_ID	Calystegine B4 methoxyamine {BP} (4TMS)	identified	ambient δ 12C	SD		Standard
889	188001	1883,7	1185EK19	M[1]	T_MSRI_ID	Galactose methoxyamine (5TMS)	identified	ambient δ 12C	SD		Standard
890	188001	1885,5	1135EC00	M[1]	T_MSRI_ID	Galactose methoxyamine (5TMS)	identified	ambient δ 12C	SD		Standard
891	188001	1892,0	2236BN50	M[2]	Q_MSRI_ID	Galactose methoxyamine (5TMS)	identified	ambient δ 12C	LJA	F	*Lotus japonicus* (Regel
892	188001	1891,7	2236BN20	M[2]	Q_MSRI_ID	Galactose methoxyamine (5TMS)	identified	ambient δ 12C	LJA	RP	*Lotus japonicus* (Regel
893	188001	1893,3	1215BK38	M[2]	Q_MSRI_ID	Galactose methoxyamine (5TMS)	identified	ambient δ 12C	SD		
894	188002	1879,8	1185EK17	M[1]	T_MSRI_ID	Mannose methoxyamine (5TMS)	identified	ambient δ 12C	SD		Standard
895	188002	1878,7	1135EC00	M[1]	T_MSRI_ID	Mannose methoxyamine (5TMS)	identified	ambient δ 12C	SD		Standard
896	188002	1888,1	1267BK12	M[2]	Q_MSRI_ID	Mannose methoxyamine (5TMS)	identified	ambient δ 12C	SD		
897	188003	1884,8	2011EC37	M[1]	T_MSRI_ID	D(-)-Galactono-1,4-lactone (4TMS)	identified	ambient δ 12C	SD		Standard
898	188004	1883,9	3161BN26	M[2]	Q_MSRI_ID	Fructose methoxyamine {BP} (5TMS)	identified	ambient δ 12C	ATH	L	*Arabidopsis thaliana* ec
899	188004	1874,1	1135EC25	M[1]	T_MSRI_ID	Fructose methoxyamine {BP} (5TMS)	identified	ambient δ 12C	ATH	R	*Arabidopsis thaliana* ec
900	188004	1875,4	1185EK18	M[1]	T_MSRI_ID	Fructose methoxyamine {BP} (5TMS)	identified	ambient δ 12C	SD		Standard
901	188004	1874,8	1135EC00	M[1]	T_MSRI_ID	Fructose methoxyamine {BP} (5TMS)	identified	ambient δ 12C	SD		Standard
902	188004	1885,6	2236BN14	M[2]	Q_MSRI_ID	Fructose methoxyamine {BP} (5TMS)	identified	ambient δ 12C	LJA	RL	*Lotus japonicus* (Regel
903	188004	1883,5	3237BF24	M[2]	Q_MSRI_ID	Fructose methoxyamine {BP} (5TMS)	identified	ambient δ 12C	SD		
904	188004	1885,1	1267BK12	M[2]	Q_MSRI_ID	Fructose methoxyamine {BP} (5TMS)	identified	ambient δ 12C	SD		
905	188005	1879,6	1344EC04	M[1]	T_MSRI_ID	Adenine (2TMS)	identified	ambient δ 12C	SD		Standard

T_MSRI_ID

Tabelle 1 / 1 | PageStyle_T_MSRI_ID | STD | Summe=4286931,2 | 100%

Fructose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O
HO
H
H
OH
H
OH
CH2OH
R:879
Pol_fa 47: FRUCTOSE MEOX2 5TMS
Hit 1
100
%
0
m/z
20 40 60 80 100 120 140 160 180 200 220 240 260 280 300 320 340 360 380

Glucose (Galactose)