

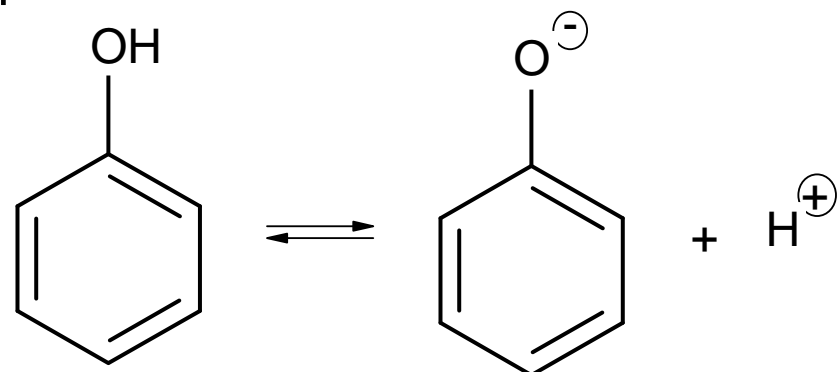
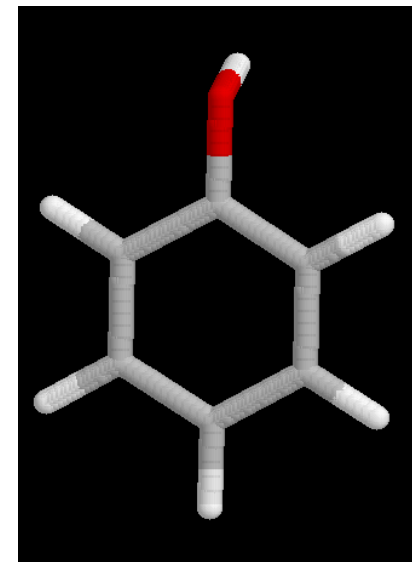
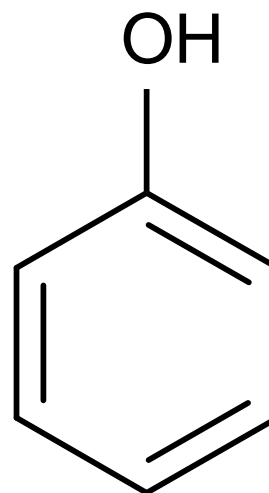
2. Phenole

Aromatische Hydroxyverbindungen

Allgemeine Eigenschaften:

Schwache Säuren

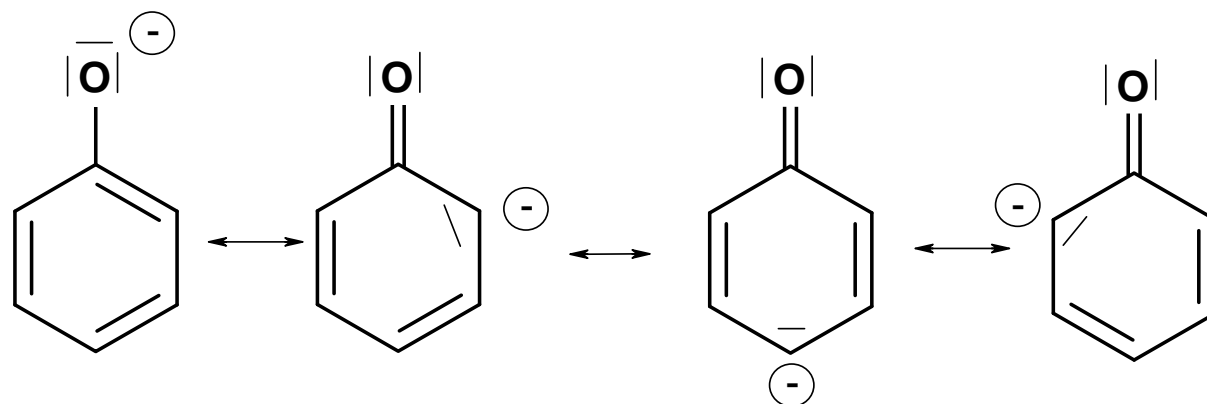
pKs 9.9



Salzbildung mit starken Basen (NaOH)

Phenolat-Anion, wasserlöslich

Mesomeriestabilisierung

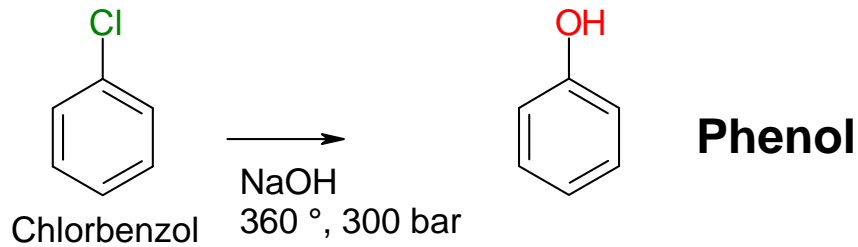


Technische Synthesen

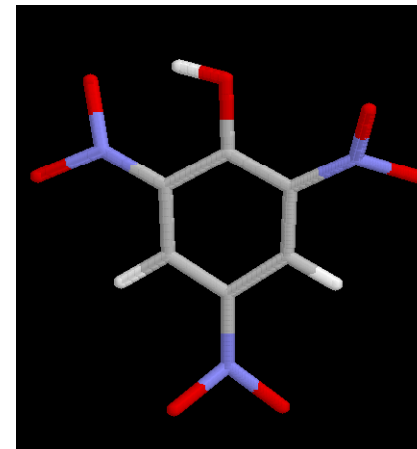
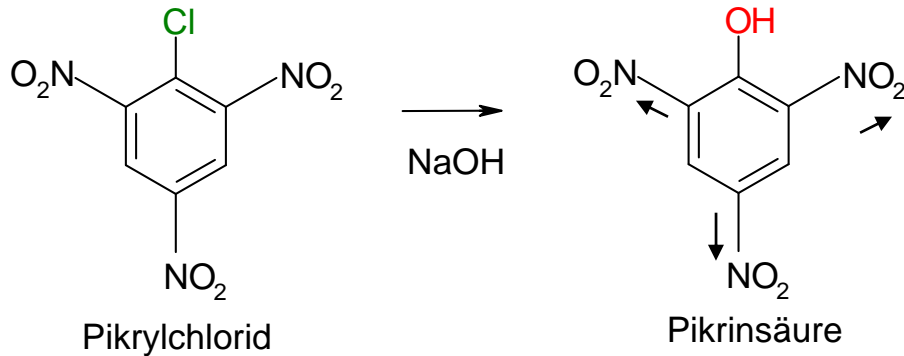
Herstellung

1. Alkalische Extraktion von Steinkohlenteer

2. DOW-Verfahren

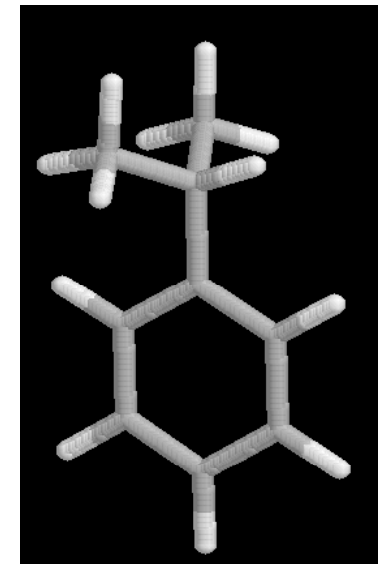
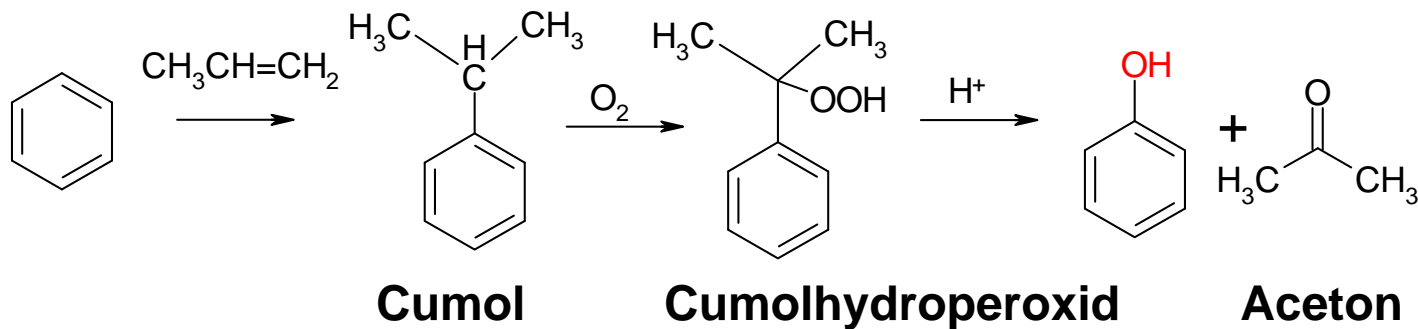


Pikrinsäure:



Pikrinsäure
pKs 0.4 !

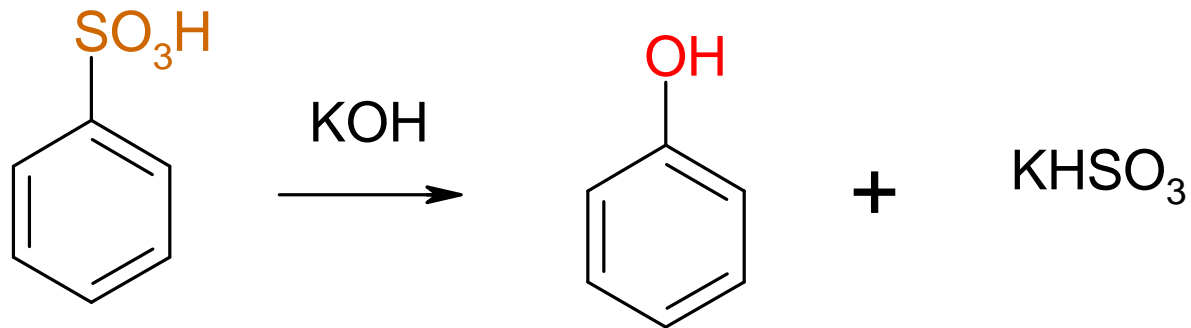
3. Cumolverfahren



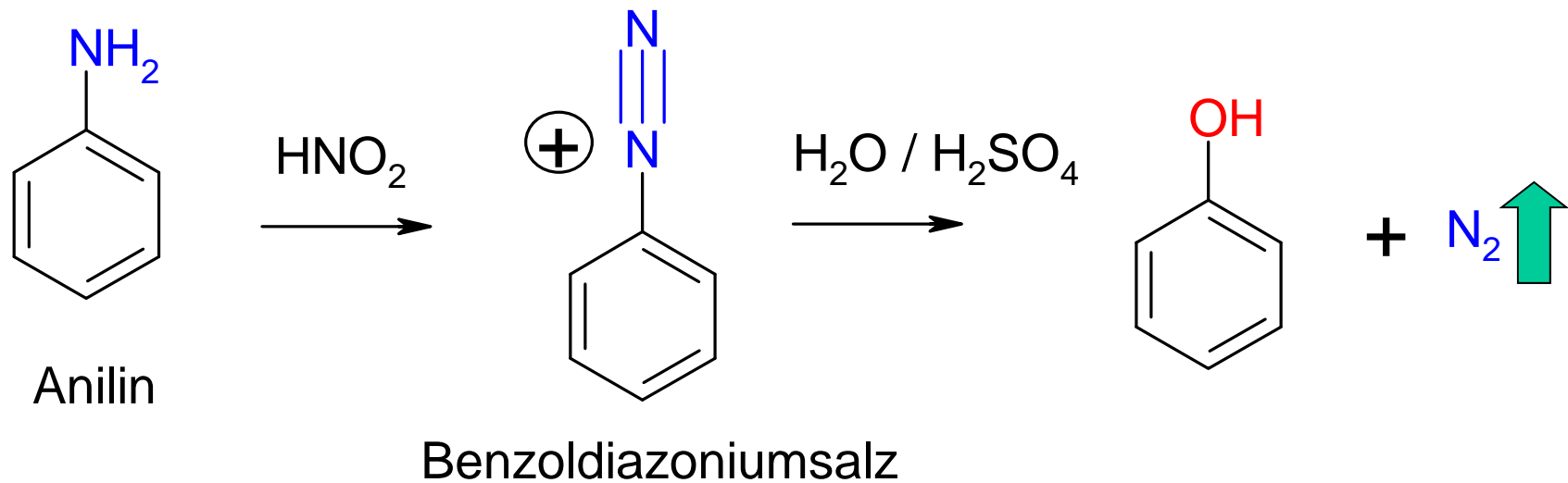
Cumol

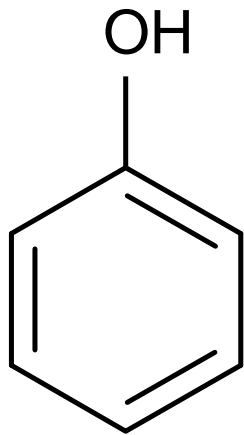
Herstellung

4. Alkalischmelze von Sulfonaten



5. "Phenolverkochung" von Diazoniumsalzen



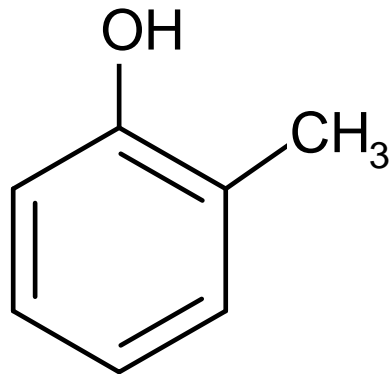
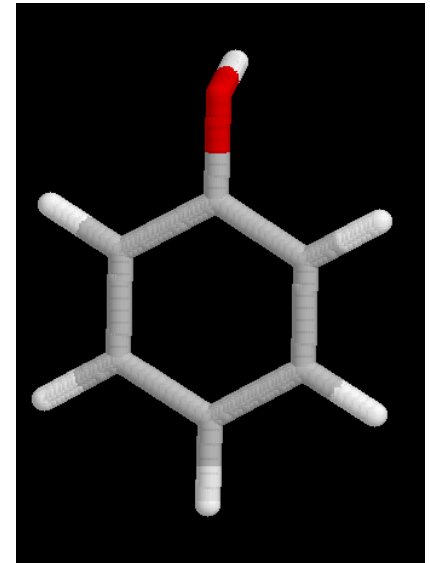


Phenol

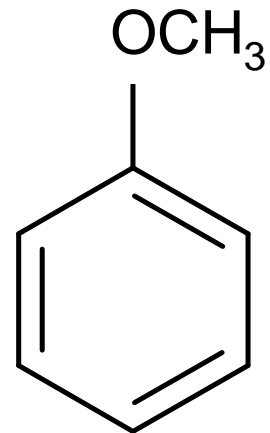
Fp.: 43 °, Kp.: 183 °

Ätzend, giftig: 1 g 

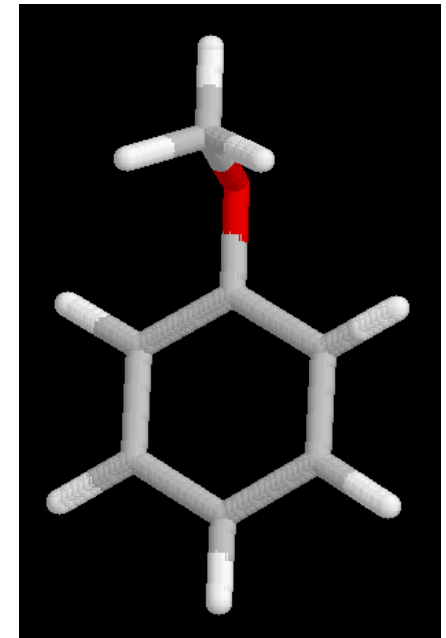
Verwendung:
Phenoplaste



o-Kresol
Raumdesinfektion



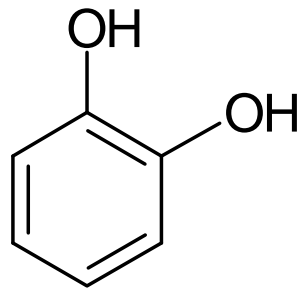
Phenolether:
Methoxyphenol
Anisol



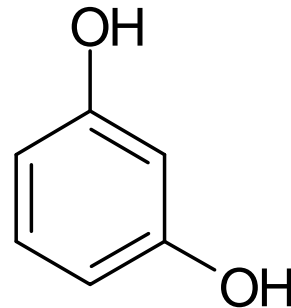
Mehrwertige Phenole

Zweiwertige Phenole

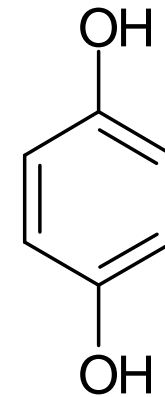
Licht-, Luft-, Schwermetallempfindlich



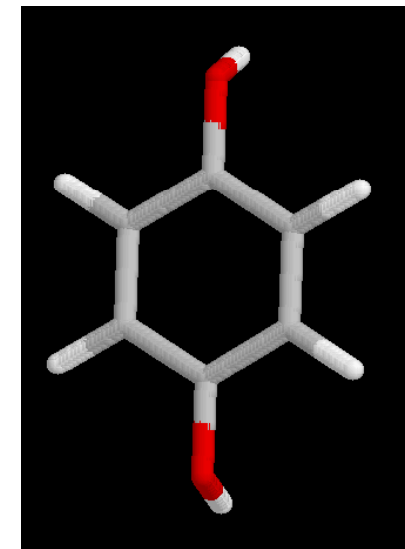
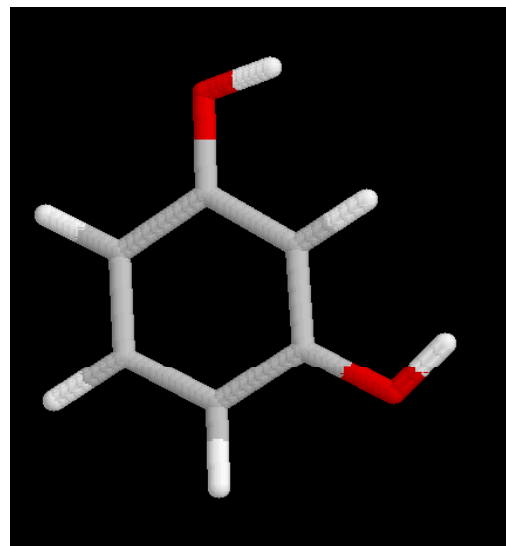
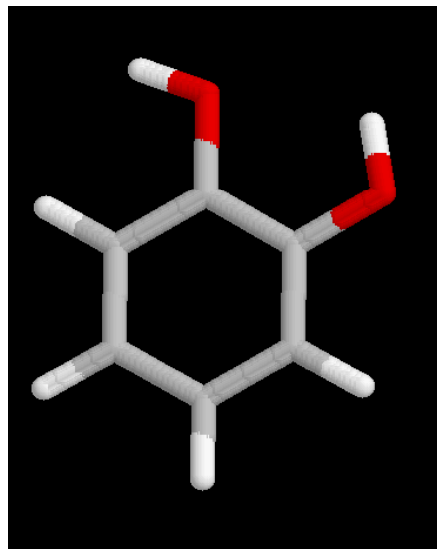
Brenzcatechin
1,2-Dihydroxybenzol



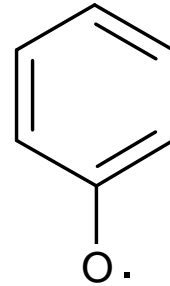
Resorcin
1,3-Dihydroxybenzol



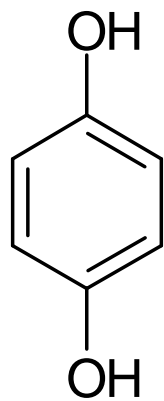
Hydrochinon
1,4-Dihydroxybenzol



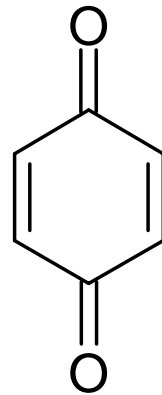
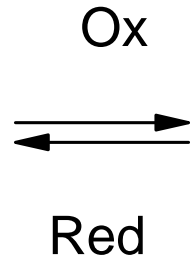
Enzymatische Bräunung:
Radikalreaktion durch
Phenoloxidasen



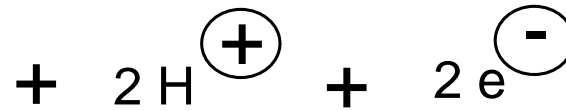
Phenoxyradikal



Hydrochinon



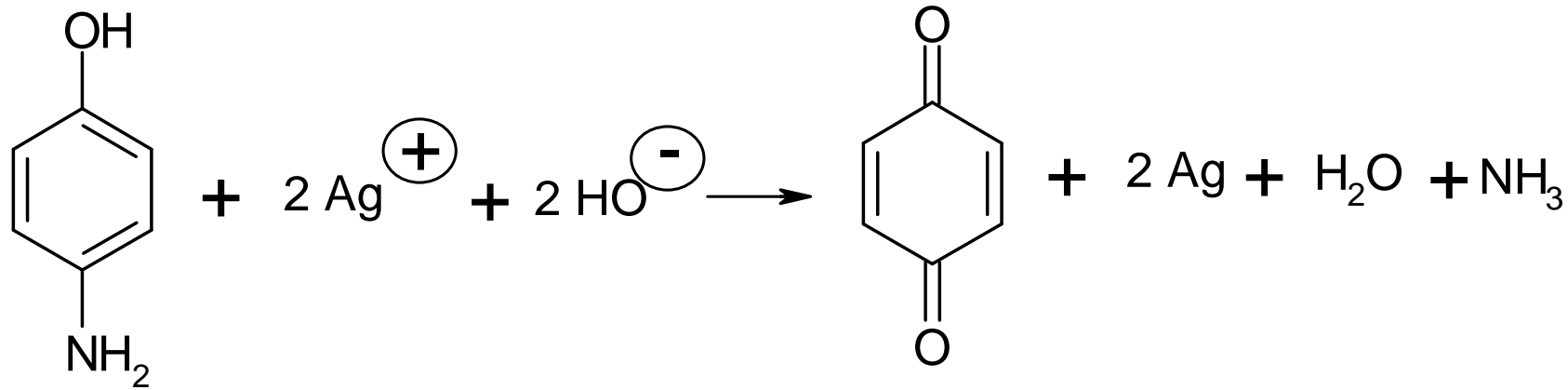
Chinon



Nicht aromatisch
(konjugiertes Keton)
Chromophor

Wirkt reduzierend
(Antioxidans)

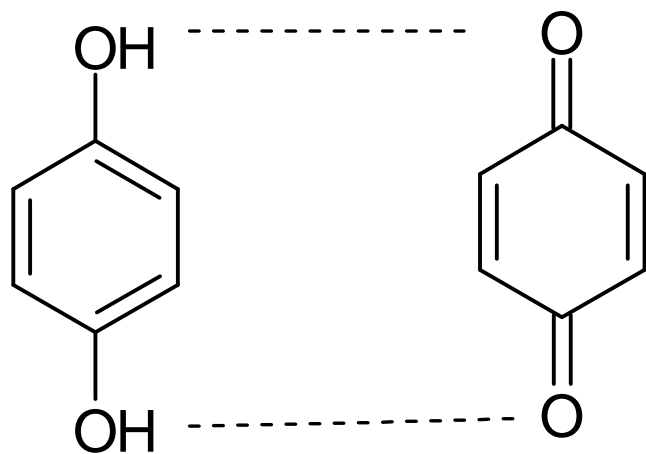
Bestandteil von Coenzymen der Atmungskette:
Ubichinon
Plastochinon



***p*-Aminophenol**

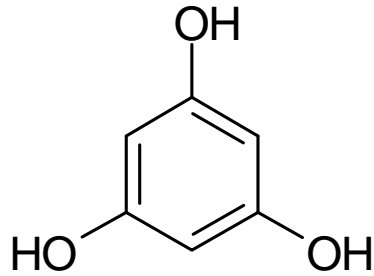
Photographische Entwickler

Chinon

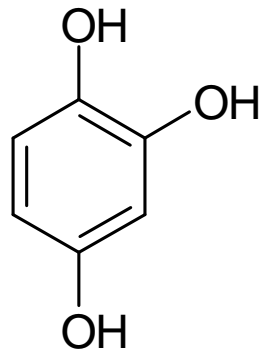


Chinhydron

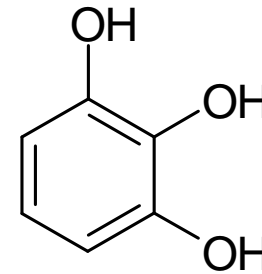
Dreiwertige Phenole



Phloroglucin
1,3,5-Trihydroxybenzol

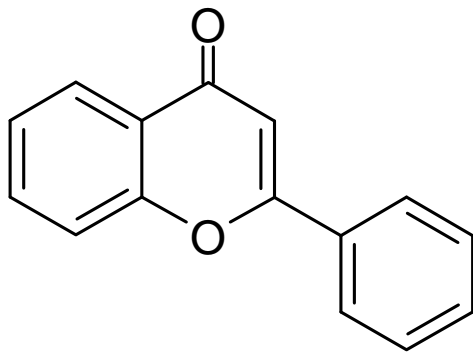


Oxyhydrochinon
1,2,4-Trihydroxybenzol

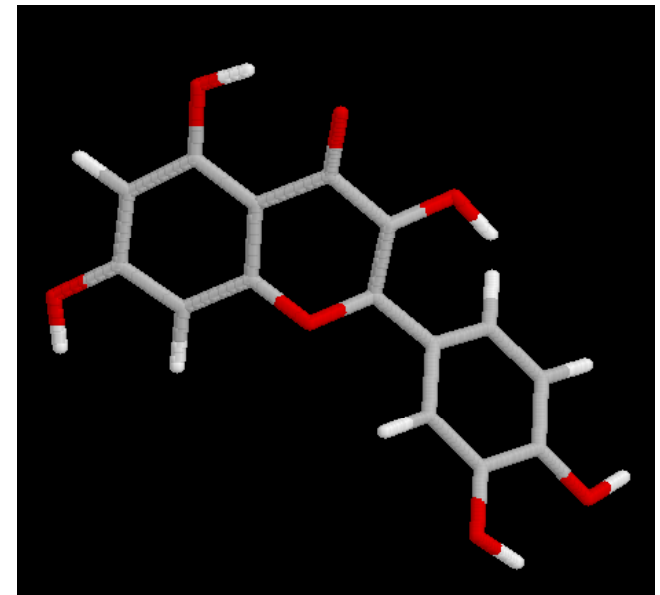


Pyrogallol
1,2,3-Trihydroxybenzol

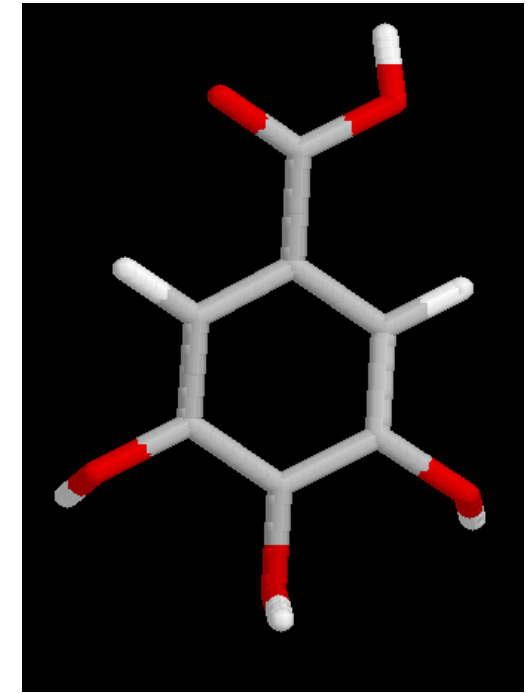
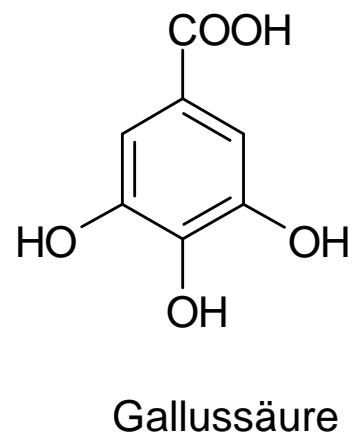
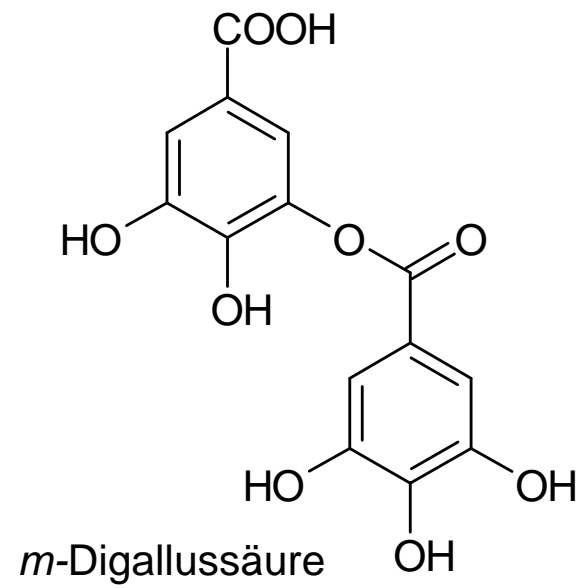
Vorkommen in Gerbstoffen, Flavonen, Anthocyanen



Grundstruktur der Flavone

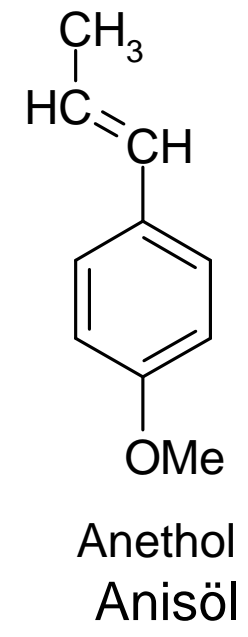
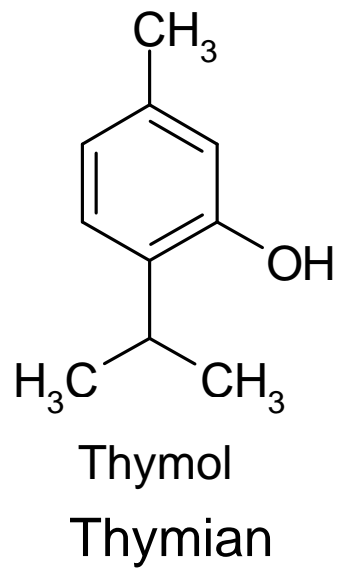
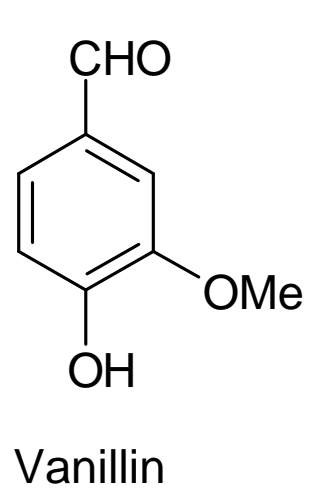


Gerbstoffe: Ester der Gallussäure (Depside)



Gallussäure

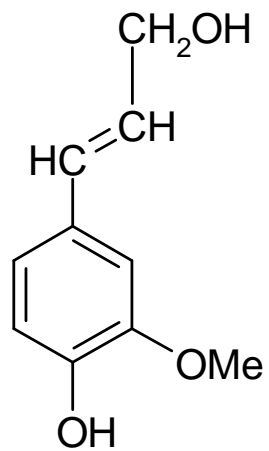
Aromastoffe



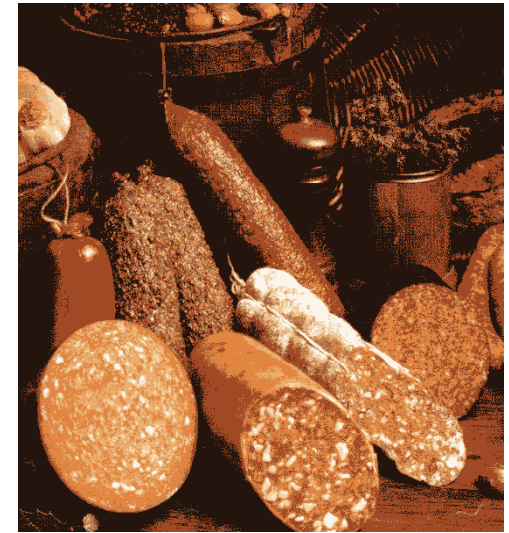
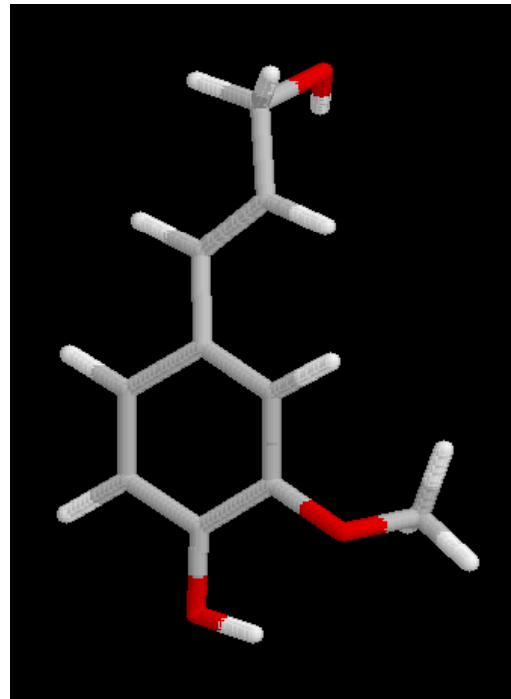
Phenole als Bausteine von Lignin (Holz: 25-30%)

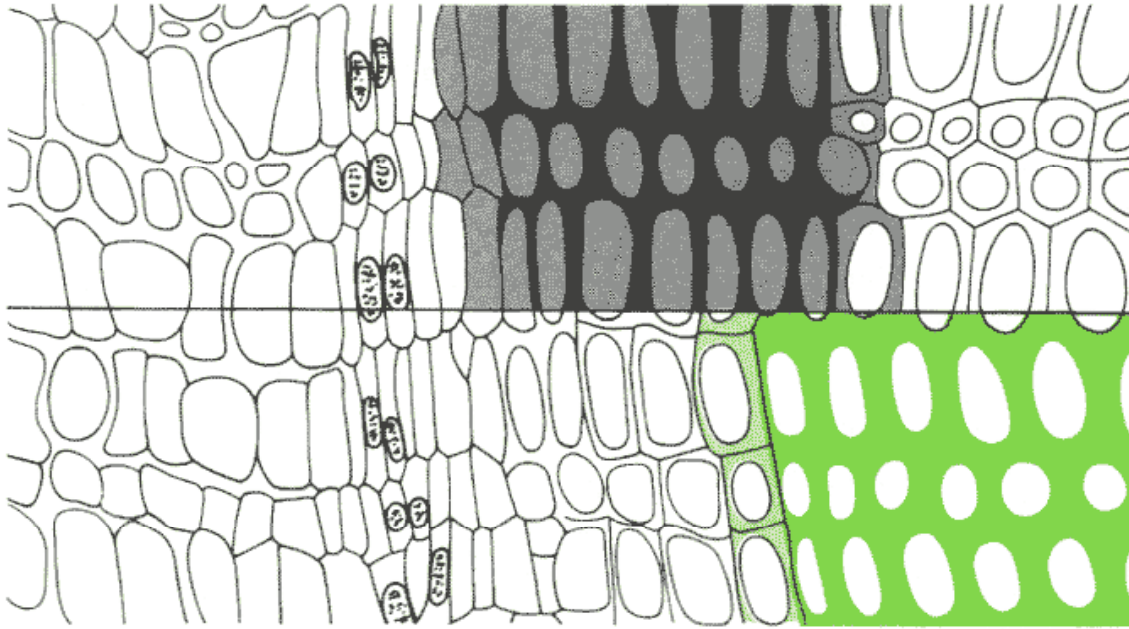
Freisetzung bei Fasslagerung, Räuchern
Wirken konservierend, bakterizid
Antioxidantien, Aroma

Phenylpropane C6-C3



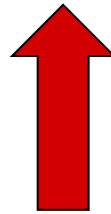
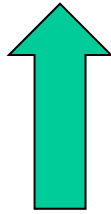
Grundbaustein
Coniferylalkohol



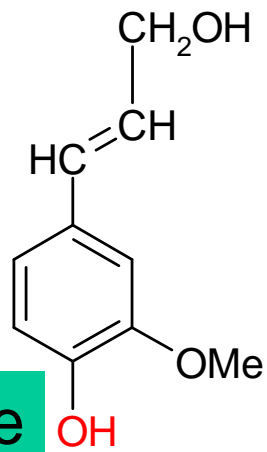


Kambium

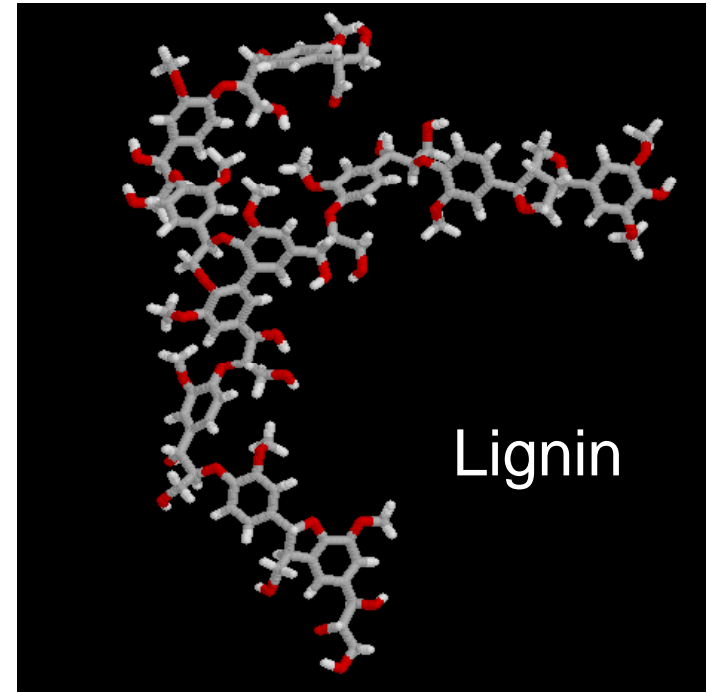
Glucosidase



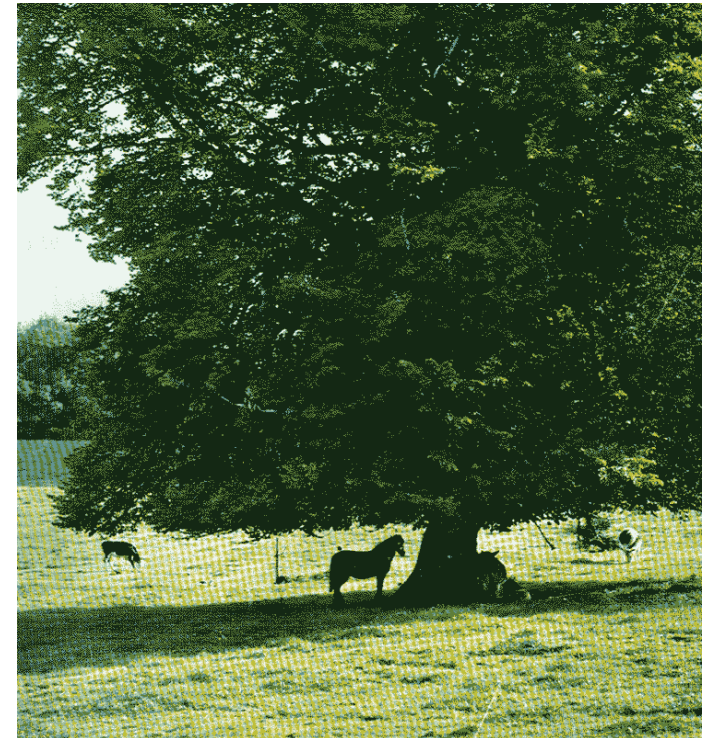
Polymerisation
der Phenole



Glucose

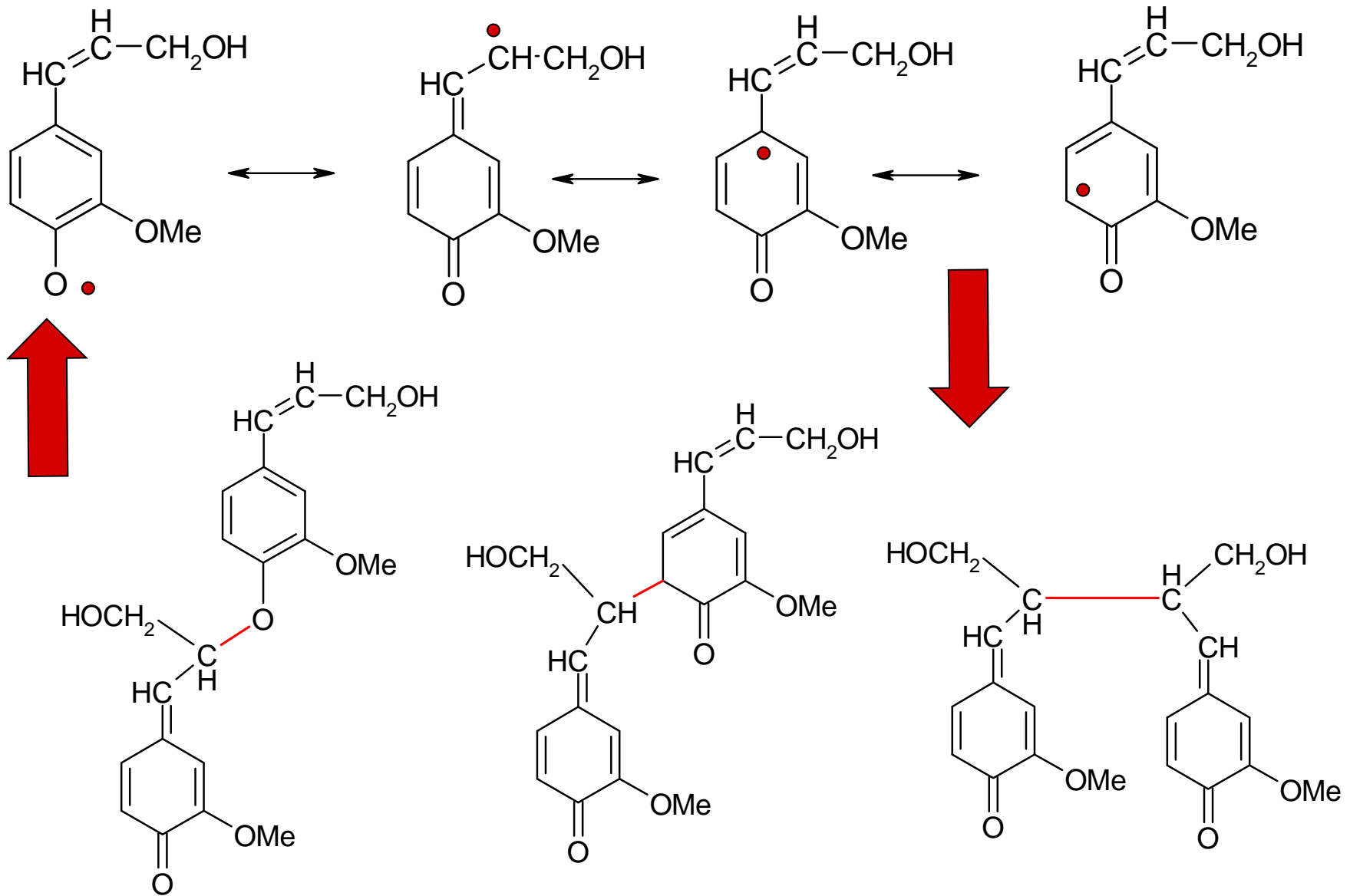


Lignin

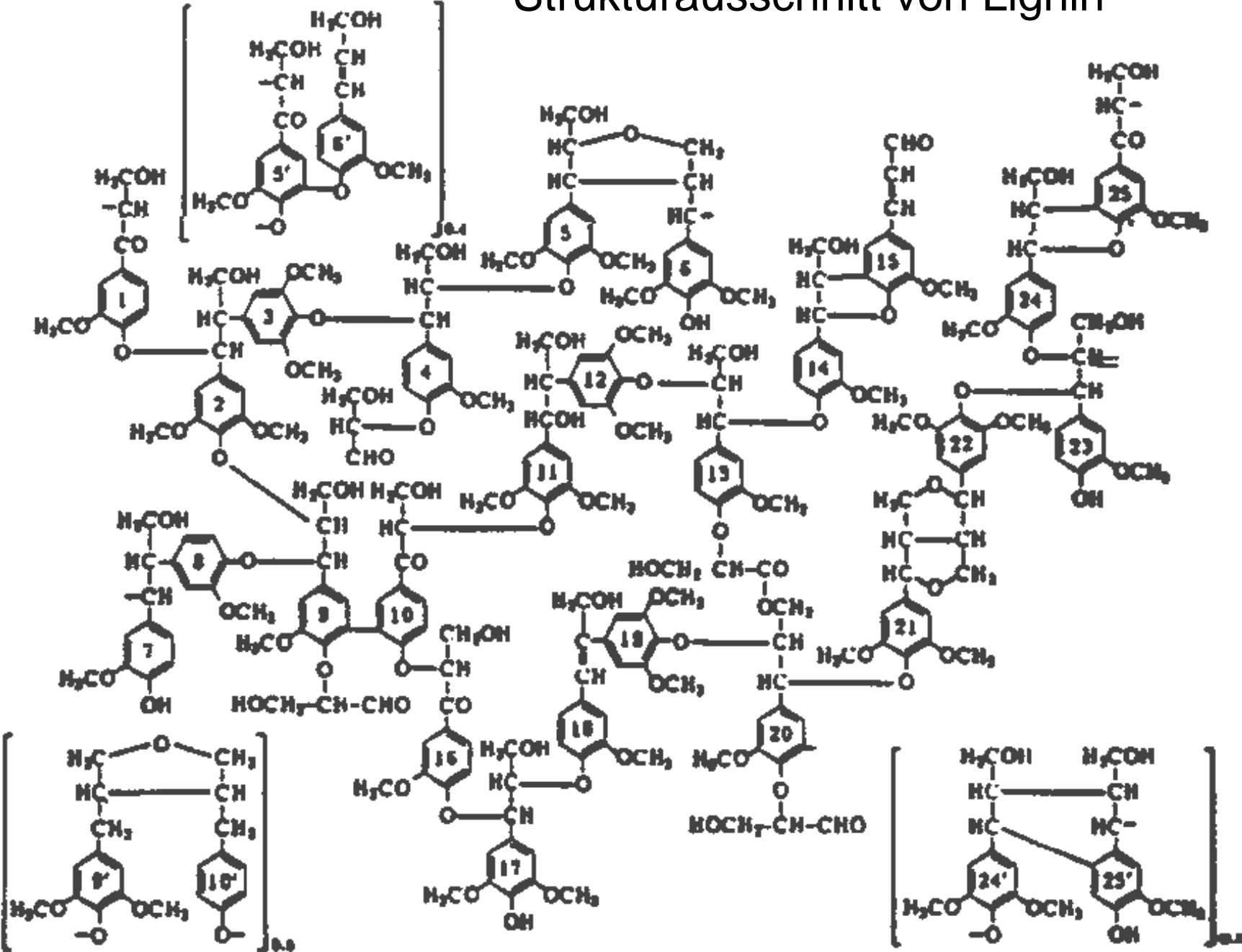


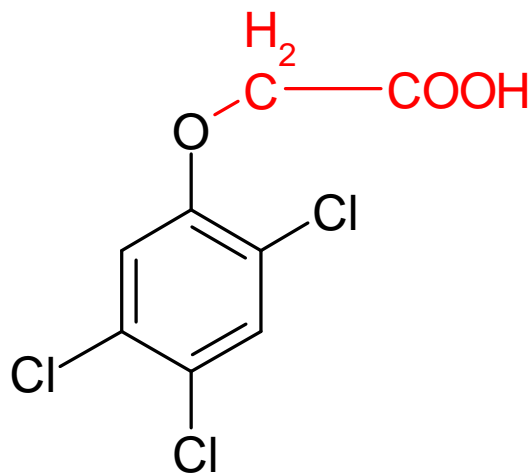
Coniferylalkohol

Mesomerie-stabilisierte Radikalbildung

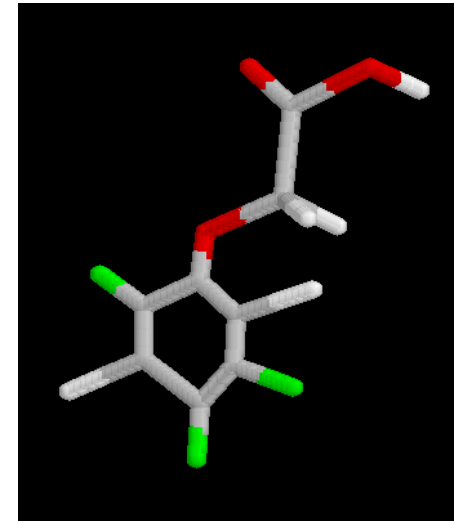


Strukturausschnitt von Lignin

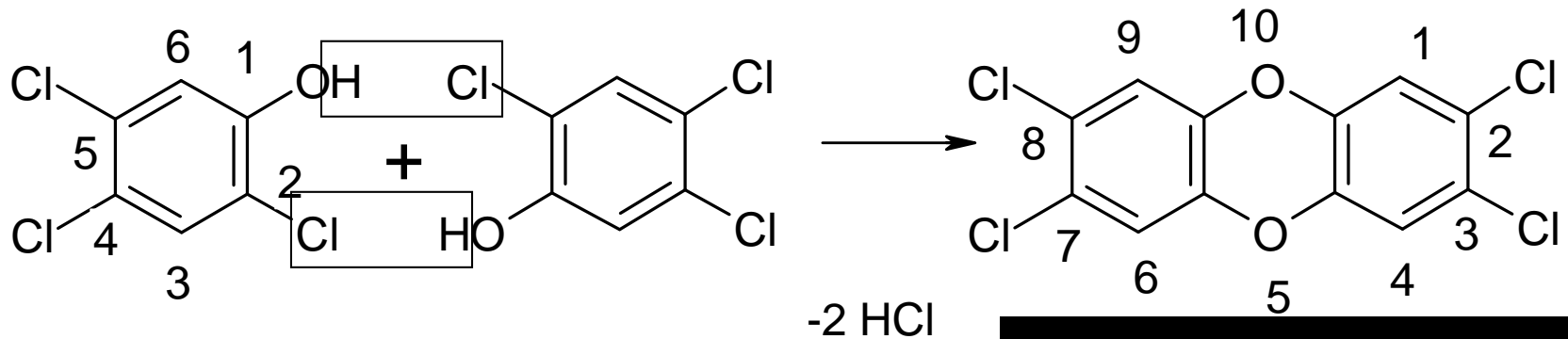




Herbizid
2,4,5-T
Trichlorphenoxyessigsäure

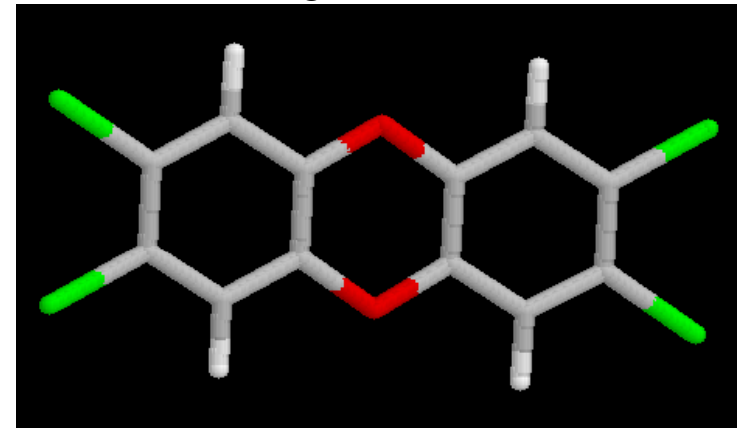


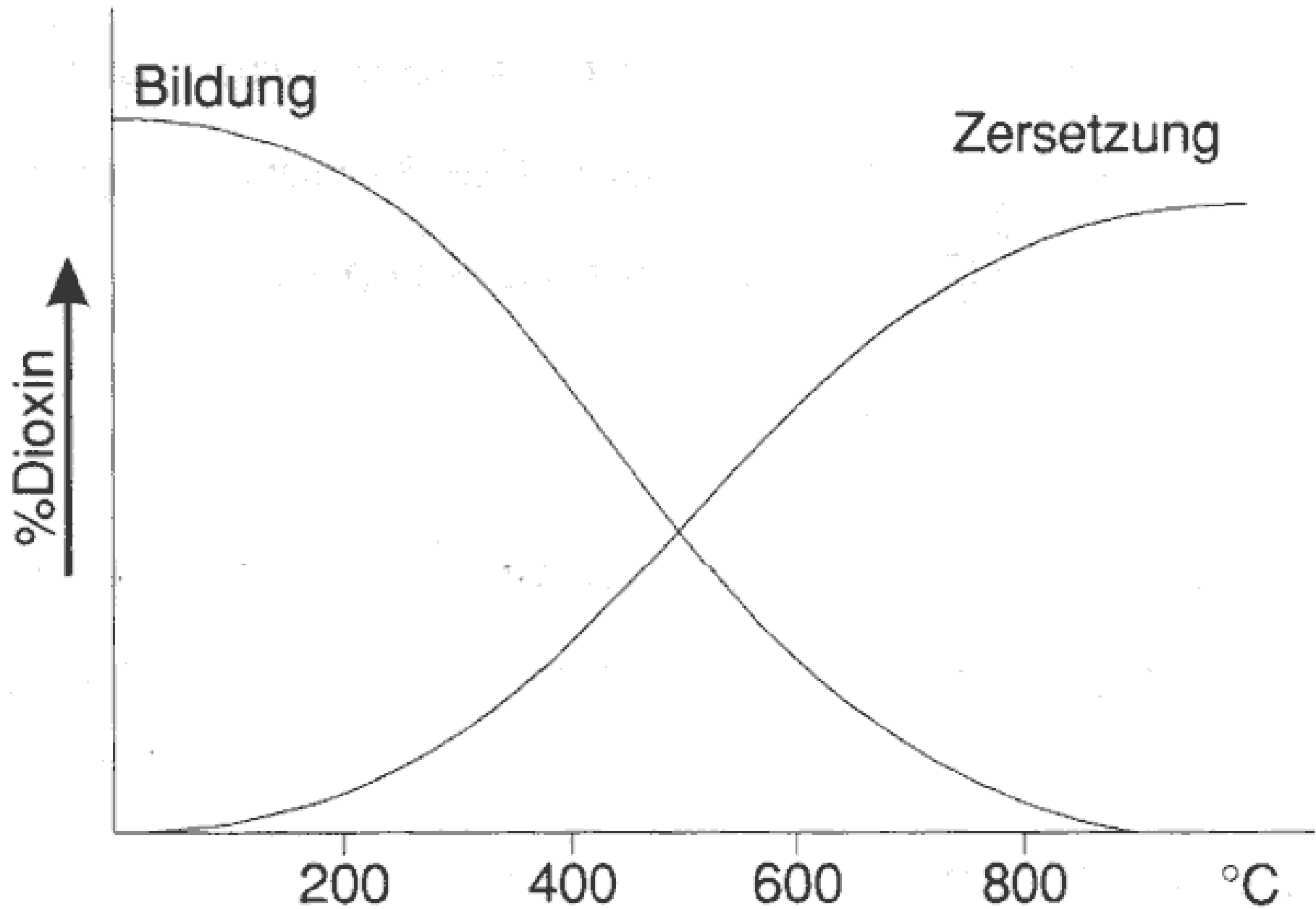
Dioxinbildung: 2,3,7,8-Tetrachlordi-*p*-benzodioxin (TCDD)



2,4,5-Trichlorphenol

LD₅₀
Maus: 0,6 µg/kg
Hamster: 3mg/kg

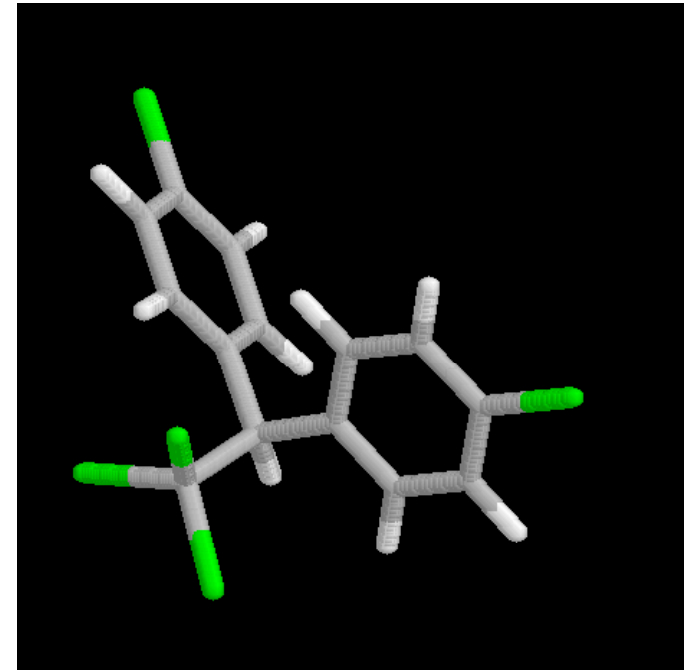
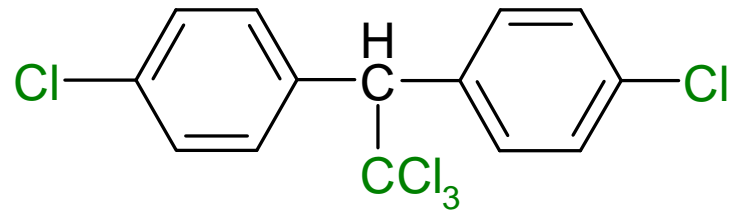




Insektizid

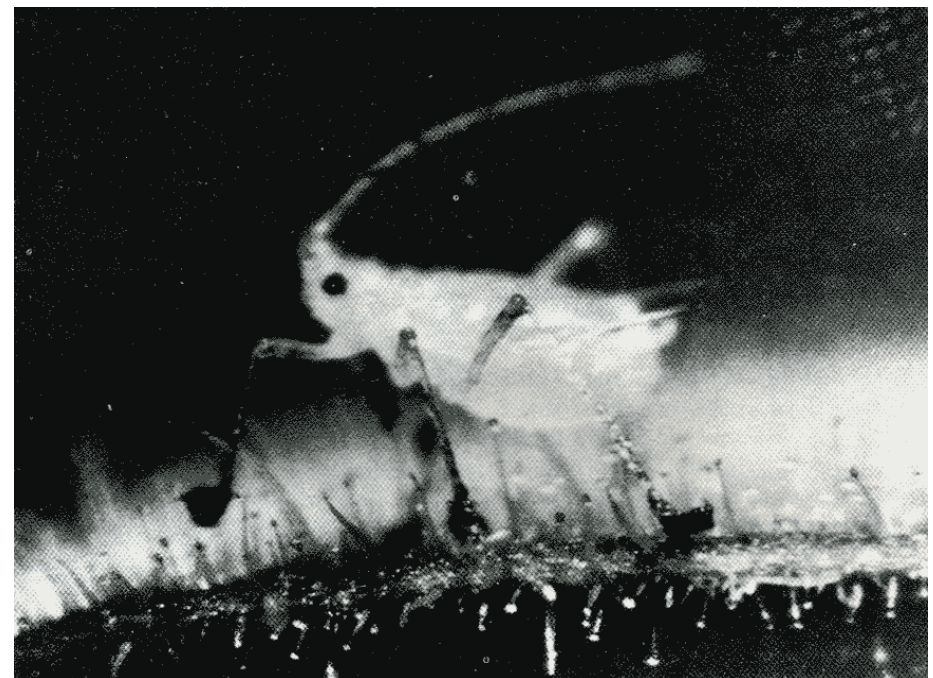
DDT

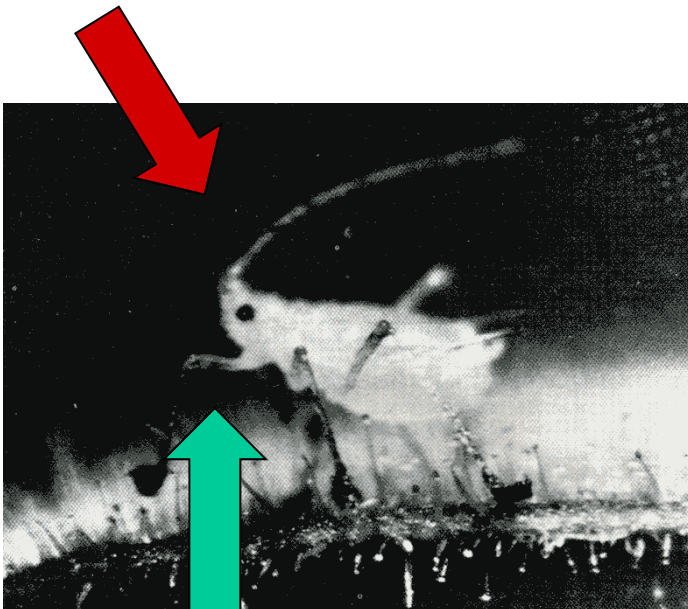
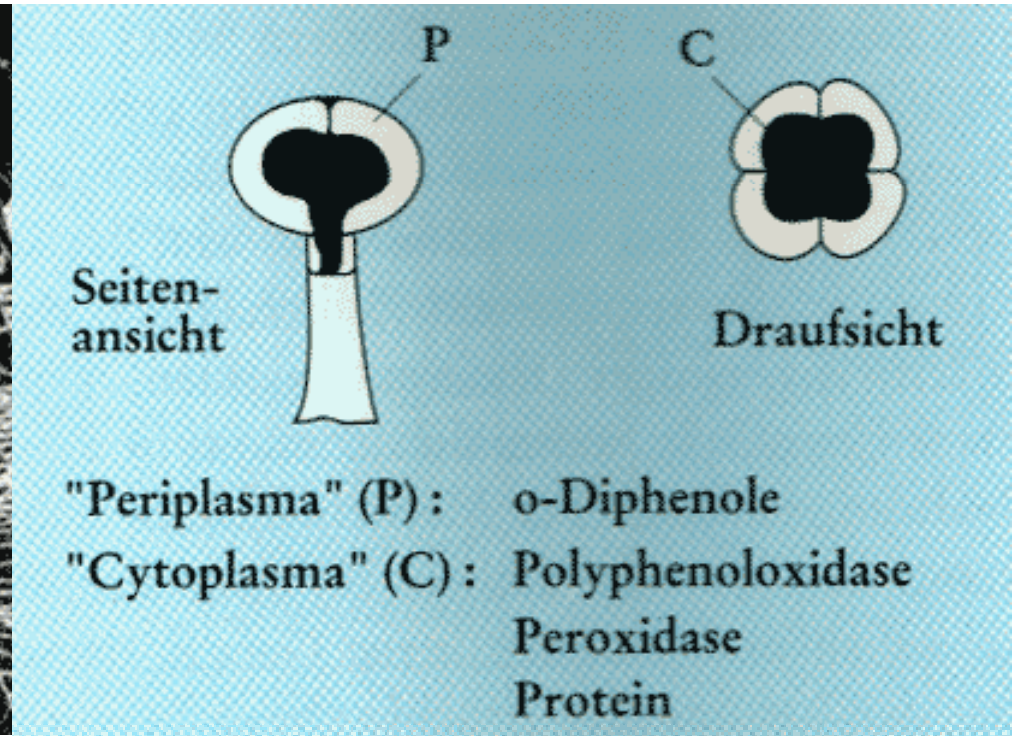
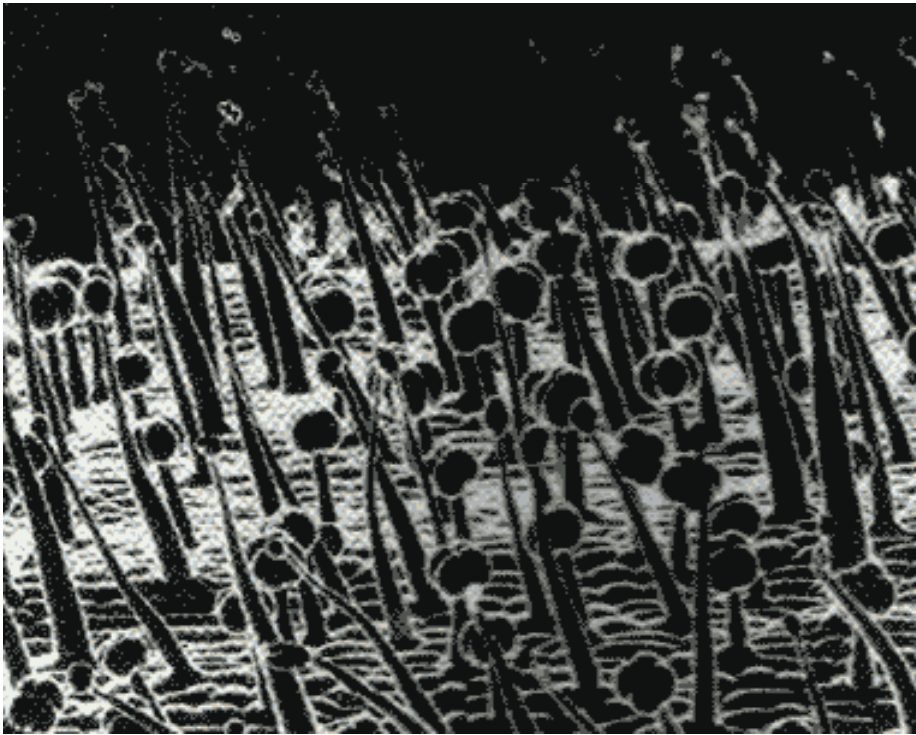
Dichlordiphenyltrichlorethan



Natürliche Abwehrstrategien:

Pheromone (Locksignale)





1. „Fixierung“ eines Insekts an der Blattoberfläche durch chemische Reaktion mit Chitin

2. Freisetzung eines Alarmpheromon

3. Freisetzung eines Lockpheromons einer Raubmilbe