

# Anorganische Verbindungen

## 1. Ionen

Hydrogencarbonat-Ion	$\text{HCO}_3^-$
Hydronium-Ion	$\text{H}_3\text{O}^+$
Carbonat-Ion	$\text{CO}_3^{2-}$
Hydroxid-Ion	$\text{OH}^-$
Hydrogenphosphat-Ion	$\text{HPO}_4^{2-}$
Dihydrogenphosphat-Ion	$\text{H}_2\text{PO}_4^-$
Nitrat-Ion	$\text{NO}_3^-$
Phosphat-Ion	$\text{PO}_4^{3-}$
Ammonium-Ion	$\text{NH}_4^+$
Permanganat-Ion	$\text{MnO}_4^-$
Chromat-Ion	$\text{CrO}_4^{2-}$
Dichromat-Ion	$\text{Cr}_2\text{O}_7^{2-}$

## 2. Komplexionen

Hexaammincobalt(II)-Kation	$[\text{Co}(\text{NH}_3)_6]^{2+}$
Hexaammincobalt(III)-Kation	$[\text{Co}(\text{NH}_3)_6]^{3+}$
Tetraamminkupfer(II)-Kation	$[\text{Cu}(\text{NH}_3)_4]^{2+}$
Diamminsilber(I)-Kation	$[\text{Ag}(\text{NH}_3)_2]^+$
Tetrahydrozinkat-Anion	$[\text{Zn}(\text{OH})_4]^{2-}$
Hexacyanidoferrat(II)-Anion	$[\text{Fe}(\text{CN})_6]^{4-}$
Tetrahydroxoaluminat(III)-Anion	$[\text{Al}(\text{OH})_4]^-$
Tetraaquakupfer(II)-Kation	$[\text{Cu}(\text{H}_2\text{O})_4]^{2+}$

## 3. Salze

Magnesiumsulfat	$\text{MgSO}_4$
Natriumhydrogencarbonat	$\text{NaHCO}_3$
Bariumsulfat	$\text{BaSO}_4$
Calciumcarbonat	$\text{CaCO}_3$
Calciumoxalat	$\text{CaC}_2\text{O}_4$
Natriumcarbonat	$\text{Na}_2\text{CO}_3$
Kaliumcarbonat	$\text{K}_2\text{CO}_3$
Kaliumcyanid	$\text{KCN}$
Ammoniumchlorid	$\text{NH}_4\text{Cl}$
Kaliumnitrat	$\text{KNO}_3$
Natriumnitrat	$\text{NaNO}_3$
Silbernitrat	$\text{AgNO}_3$
Natriumdihydrogenphosphat	$\text{NaH}_2\text{PO}_4$
Dinatriumhydrogenphosphat	$\text{Na}_2\text{HPO}_4$
Natriumphosphat	$\text{Na}_3\text{PO}_4$
Kaliumdihydrogenphosphat	$\text{KH}_2\text{PO}_4$
Dikaliumhydrogenphosphat	$\text{K}_2\text{HPO}_4$
Tri-Kaliumphosphat	$\text{K}_3\text{PO}_4$

Calciumphosphat	$\text{Ca}_3(\text{PO}_4)_2$
Natriumsulfat	$\text{Na}_2\text{SO}_4$
Natriumsulfit	$\text{Na}_2\text{SO}_3$
Natriumchlorid	$\text{NaCl}$
Natriumiodid	$\text{NaI}$
Kaliumbromid	$\text{KBr}$
Calciumfluorid	$\text{CaF}_2$
Calciumchlorid	$\text{CaCl}_2$
Bariumchlorid	$\text{BaCl}_2$
Silberchlorid	$\text{AgCl}$
Eisen(III)chlorid	$\text{FeCl}_3$
Eisen(II)sulfat	$\text{FeSO}_4$
Zinksulfat	$\text{ZnSO}_4$
Kupfer(II)sulfat	$\text{CuSO}_4$
Calciumsulfat	$\text{CaSO}_4$

#### 4. Säuren

Oxalsäure	$\text{C}_2\text{H}_2\text{O}_4$
Kohlensäure	$\text{H}_2\text{CO}_3$
Salpetersäure	$\text{HNO}_3$
Blausäure	$\text{HCN}$
Phosphorsäure	$\text{H}_3\text{PO}_4$
Schwefelwasserstoff	$\text{H}_2\text{S}$
Schwefelsäure	$\text{H}_2\text{SO}_4$
schweflige Säure	$\text{H}_2\text{SO}_3$
Chlorwasserstoff	$\text{HCl}$
Perchlorsäure	$\text{HClO}_4$

#### 5. Basen

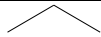
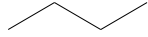
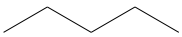
Natriumhydroxid (nur nach Arrhenius)	$\text{NaOH}$
Kaliumhydroxid (nur nach Arrhenius)	$\text{KOH}$
Calciumhydroxid (nur nach Arrhenius)	$\text{Ca}(\text{OH})_2$
Magnesiumhydroxid (nur nach Arrhenius)	$\text{Mg}(\text{OH})_2$
Ammoniak	$\text{NH}_3$




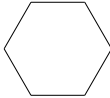
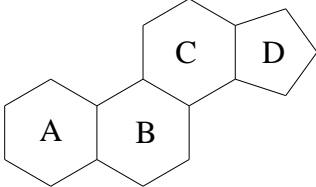
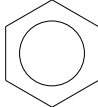
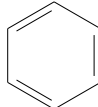
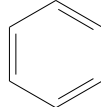
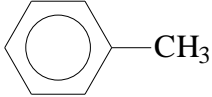
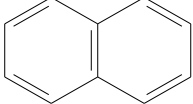
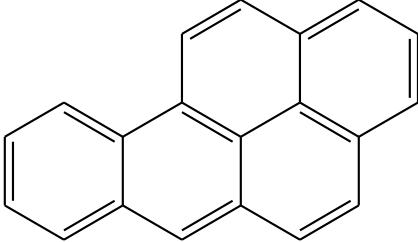
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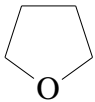
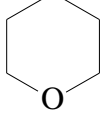
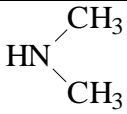
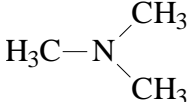
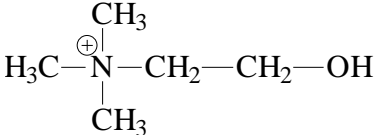
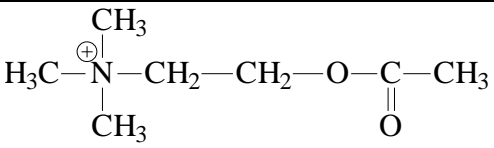
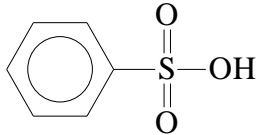
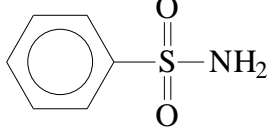
Wasser	H <sub>2</sub> O
Sauerstoff	O <sub>2</sub>
Ozon	O <sub>3</sub>
Wasserstoff	H <sub>2</sub>
Wasserstoffperoxid	H <sub>2</sub> O <sub>2</sub>
Fluorwasserstoff	HF
Iodwasserstoff	HI
Kohlendioxid	CO <sub>2</sub>
Kohlenmonoxid	CO
Stickstoff	N <sub>2</sub>
Stickstoffmonoxid	NO
Distickstoffmonoxid	N <sub>2</sub> O
Schwefeldioxid	SO <sub>2</sub>
Chlor	Cl <sub>2</sub>
Brom	Br <sub>2</sub>
Iod	I <sub>2</sub>
Eisensulfid	FeS

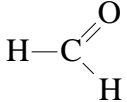
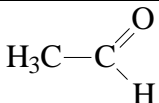
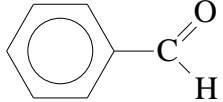
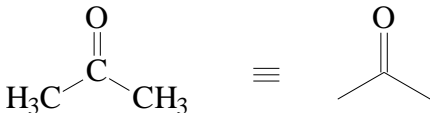
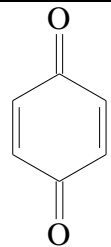
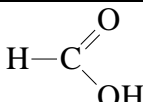
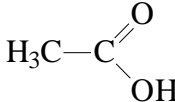
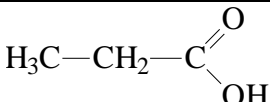
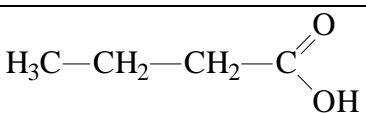
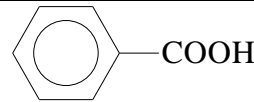
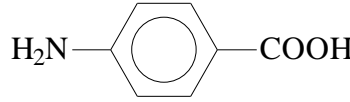
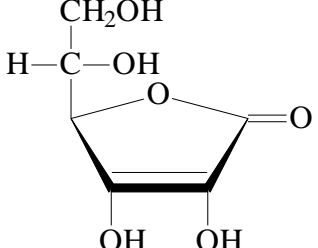
## Organische Verbindungen

### 1. Kohlenwasserstoffe

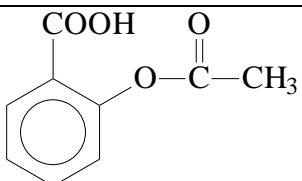
Alkane	
Methan	CH <sub>4</sub>
Ethan	H <sub>3</sub> C—CH <sub>3</sub>
Propan	H <sub>3</sub> C—CH <sub>2</sub> —CH <sub>3</sub> ≡ 
n-Butan	H <sub>3</sub> C—CH <sub>2</sub> —CH <sub>2</sub> —CH <sub>3</sub> ≡ 
2-Methyl-propan ≡ Isobutan	$\begin{array}{c} \text{CH}_3 \\   \\ \text{H}_3\text{C}-\text{CH}-\text{CH}_3 \end{array} \equiv \text{Skeletal structure of isobutane: a three-carbon chain with a methyl group on the second carbon.}$
n-Pentan	H <sub>3</sub> C—CH <sub>2</sub> —CH <sub>2</sub> —CH <sub>2</sub> —CH <sub>3</sub> ≡ 
2-Methyl-butan ≡ Isopentan	$\begin{array}{c} \text{CH}_3 \\   \\ \text{H}_3\text{C}-\text{CH}-\text{CH}_2-\text{CH}_3 \end{array} \equiv \text{Skeletal structure of isopentane: a four-carbon chain with a methyl group on the second carbon.}$
2,2-Dimethyl-propan ≡ Neopentan	$\begin{array}{c} \text{CH}_3 \\   \\ \text{H}_3\text{C}-\text{C}-\text{CH}_3 \\   \\ \text{CH}_3 \end{array} \equiv \text{Skeletal structure of neopentane: a central carbon atom bonded to four methyl groups in a cross shape.}$
n-Hexan	H <sub>3</sub> C—CH <sub>2</sub> —CH <sub>2</sub> —CH <sub>2</sub> —CH <sub>2</sub> —CH <sub>3</sub>
2-Methyl-pentan ≡ Isohexan	$\begin{array}{c} \text{CH}_3 \\   \\ \text{H}_3\text{C}-\text{CH}-\text{CH}_2-\text{CH}_2-\text{CH}_3 \end{array} \equiv \text{Skeletal structure of isohexane: a five-carbon chain with a methyl group on the second carbon.}$
3-Methyl-pentan	$\begin{array}{c} \text{CH}_3 \\   \\ \text{H}_3\text{C}-\text{CH}_2-\text{CH}-\text{CH}_2-\text{CH}_3 \end{array} \equiv \text{Skeletal structure of 3-methylpentane: a five-carbon chain with a methyl group on the third carbon.}$

Cyclopropan	
Cyclobutan	
Cyclopentan	
Cyclohexan	
Steran (Gonan)	
<b>Alkene</b>	
Ethen	$\text{H}_2\text{C}=\text{CH}_2$
Propen	$\text{H}_2\text{C}=\text{CH}-\text{CH}_3$
Buta-1,3-dien (1,3-Butadien)	$\text{H}_2\text{C}=\text{CH}-\text{CH}=\text{CH}_2$
Isopren $\equiv$ 2-Methyl-buta-1,3-dien	$\begin{array}{c} \text{CH}_3 \\   \\ \text{H}_2\text{C}=\text{C}-\text{CH}=\text{CH}_2 \end{array} \equiv \text{isoprene structure}$
But-2-en	$\text{H}_3\text{C}-\text{CH}=\text{CH}-\text{CH}_3$
<i>cis</i> -Buten (Z-But-2-en)	$\begin{array}{c} \text{H} \quad \quad \text{H} \\ \diagdown \quad \diagup \\ \text{C}=\text{C} \\ \diagup \quad \diagdown \\ \text{H}_3\text{C} \quad \text{CH}_3 \end{array}$
<i>trans</i> -Buten (E-But-2-en)	$\begin{array}{c} \text{H}_3\text{C} \quad \quad \text{H} \\ \diagdown \quad \diagup \\ \text{C}=\text{C} \\ \diagup \quad \diagdown \\ \text{H} \quad \quad \text{CH}_3 \end{array}$
<b>Aromaten</b>	
Benzen (Benzol)	 $\equiv$  $\equiv$ 
Toluen (Toluol)	
Naphthalin	
Benzo(a)pyren	

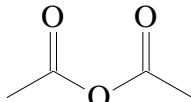
<b>Halogenkohlenwasserstoffe</b>	
Chloroform $\equiv$ Trichlormethan	$\text{CHCl}_3$
Tetrachlorkohlenstoff	$\text{CCl}_4$
Methyliodid $\equiv$ Iodmethan	$\text{CH}_3\text{I}$
<b>Thiole (Mercaptane)</b>	
Ethanthiol	$\text{H}_3\text{C}-\text{CH}_2-\text{SH}$
<b>Ether</b>	
Diethylether	$\text{H}_3\text{C}-\text{CH}_2-\text{O}-\text{CH}_2-\text{CH}_3 \equiv \text{---O---}$
Tetrahydrofuran	
Tetrahydropyran	
<b>Amine</b>	
Methylamin	$\text{H}_3\text{C}-\text{NH}_2$
Dimethylamin	
Trimethylamin	
Ethanolamin	$\text{H}_2\text{N}-\text{CH}_2-\text{CH}_2-\text{OH} \equiv \text{H}_2\text{N}-\text{---OH}$
Cholin	
Acetylcholin	
<b>Sulfonsäuren</b>	
Benzolsulfonsäure	
Sulfonsäureamide (z.B. Benzolsulfonsäureamid)	

<b>Aldehyde, Ketone</b>	
Formaldehyd	
Acetaldehyd	
Benzaldehyd	
Aceton	
<b>Chinone</b>	
p-Benzochinon	
<b>Carbonsäuren (Anion)</b>	
Ameisensäure (Formiat)	
Essigsäure (Acetat)	
Propionsäure (Propionat) ≡ Propansäure	
n-Buttersäure (Butyrat) ≡ Butansäure	
Benzoessäure (Benzoat) (FS)	
p-Aminobenzoessäure [PABS]	
Ascorbinsäure (Vitamin C)	

**Carbonsäureester**

Essigsäureethylester	$\text{H}_3\text{C}-\overset{\text{O}}{\parallel}{\text{C}}-\text{O}-\text{C}_2\text{H}_5 \quad \equiv \quad \text{CH}_3-\overset{\text{O}}{\parallel}{\text{C}}-\text{O}-\text{CH}_2\text{CH}_3$
Acetessigsäureethylester	$\text{H}_3\text{C}-\overset{\text{O}}{\parallel}{\text{C}}-\text{CH}_2-\overset{\text{O}}{\parallel}{\text{C}}-\text{O}-\text{C}_2\text{H}_5 \quad \equiv \quad \text{CH}_3-\overset{\text{O}}{\parallel}{\text{C}}-\text{CH}_2-\overset{\text{O}}{\parallel}{\text{C}}-\text{O}-\text{CH}_2\text{CH}_3$
Acetylsalicylsäure	
Tristearin	$\begin{array}{l} \text{H}_2\text{C}-\text{O}-\text{CO}-(\text{CH}_2)_{16}-\text{CH}_3 \\   \\ \text{HC}-\text{O}-\text{CO}-(\text{CH}_2)_{16}-\text{CH}_3 \\   \\ \text{H}_2\text{C}-\text{O}-\text{CO}-(\text{CH}_2)_{16}-\text{CH}_3 \end{array}$

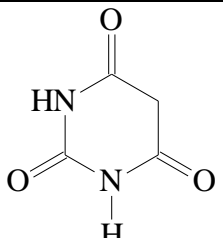
**Säureanhydride**

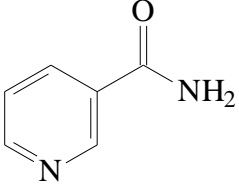
Acetanhydrid	
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**Säurechloride**

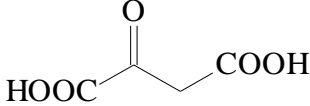
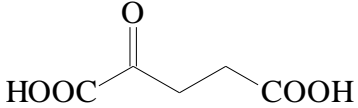
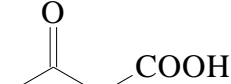
Acetylchlorid	$\text{H}_3\text{C}-\overset{\text{O}}{\parallel}{\text{C}}-\text{Cl}$
Phosgen -erkennen-	$\text{Cl}-\overset{\text{O}}{\parallel}{\text{C}}-\text{Cl}$

**Säureamide**

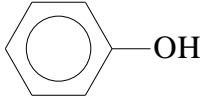
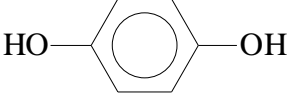
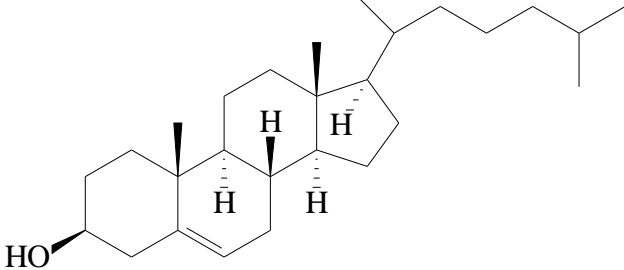
Harnstoff	$\text{O}=\overset{\text{NH}_2}{\text{C}}-\overset{\text{NH}_2}{\text{C}}$
Guanidin	$\text{HN}=\overset{\text{NH}_2}{\text{C}}-\overset{\text{NH}_2}{\text{C}}$
Barbitursäure	

Nikotinsäureamid	
<b>Dicarbonsäuren (Anion)</b>	
Oxalsäure (Oxalat)	$\text{HOOC}-\text{COOH}$
Malonsäure (Malonat)	$\text{HOOC}-\text{CH}_2-\text{COOH}$
Bernsteinsäure (Succinat)	$\text{HOOC}-\text{CH}_2-\text{CH}_2-\text{COOH}$
Glutarsäure (Glutarat)	$\text{HOOC}-\text{CH}_2-\text{CH}_2-\text{CH}_2-\text{COOH}$
Fumarsäure (Fumarat)	$\begin{array}{c} \text{H} \quad \text{COOH} \\ \diagdown \quad / \\ \text{C}=\text{C} \\ / \quad \diagdown \\ \text{HOOC} \quad \text{H} \end{array}$
Maleinsäure (Maleat)	$\begin{array}{c} \text{H} \quad \text{H} \\ \diagdown \quad / \\ \text{C}=\text{C} \\ / \quad \diagdown \\ \text{HOOC} \quad \text{COOH} \end{array}$
<b>Hydroxy- und Ketocarbonsäuren (Anion)</b>	
Milchsäure (Lactat)	Zitronensäure $\begin{array}{c} \text{OH} \\   \\ \text{H}_3\text{C}-\text{CH}-\text{COOH} \end{array} \equiv \begin{array}{c} \text{OH} \\   \\ \text{CH}-\text{COOH} \end{array}$
Äpfelsäure (Malat)	$\begin{array}{c} \text{HOOC}-\text{CH}-\text{CH}_2-\text{COOH} \\   \\ \text{OH} \end{array} \equiv \begin{array}{c} \text{HOOC}-\text{CH}-\text{CH}_2-\text{COOH} \\   \\ \text{OH} \end{array}$
Weinsäure (Tartrat)	$\begin{array}{c} \text{HOOC}-\text{CH}-\text{CH}-\text{COOH} \\   \quad   \\ \text{OH} \quad \text{OH} \end{array} \equiv \begin{array}{c} \text{HOOC}-\text{CH}-\text{CH}-\text{COOH} \\   \quad   \\ \text{OH} \quad \text{OH} \end{array}$
3-Hydroxybuttersäure (3-Hydroxybutyrat)	$\begin{array}{c} \text{H}_3\text{C}-\text{CH}-\text{CH}_2-\text{COOH} \\   \\ \text{OH} \end{array} \equiv \begin{array}{c} \text{CH}_3-\text{CH}-\text{CH}_2-\text{COOH} \\   \\ \text{OH} \end{array}$
Zitronensäure (Citrat)	$\begin{array}{c} \text{COOH} \\   \\ \text{CH}_2 \\   \\ \text{HO}-\text{C}-\text{COOH} \\   \\ \text{CH}_2 \\   \\ \text{COOH} \end{array} \equiv \begin{array}{c} \text{COOH} \\   \\ \text{CH}_2-\text{C}-\text{COOH} \\   \\ \text{HO} \end{array}$
Brenztraubensäure (Pyruvat)	$\begin{array}{c} \text{O} \\    \\ \text{CH}_3-\text{C}-\text{COOH} \end{array}$



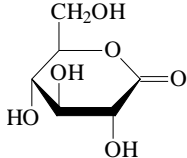
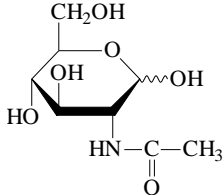
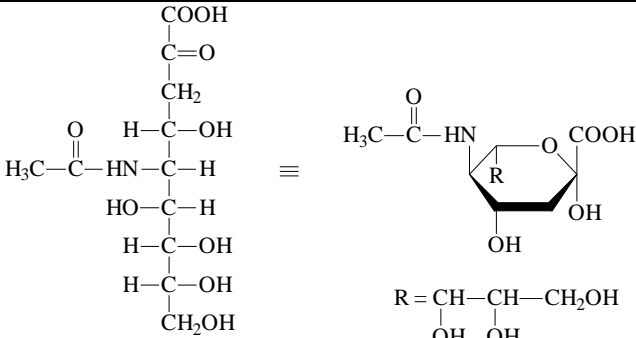
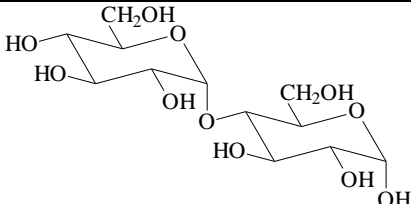
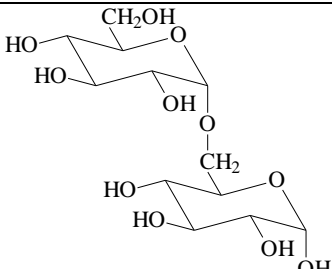
Oxalessigsäure	
$\alpha$ -Ketoglutarsäure	
Acetessigsäure	

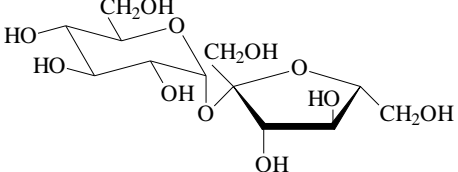
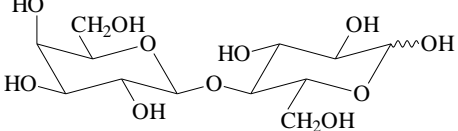
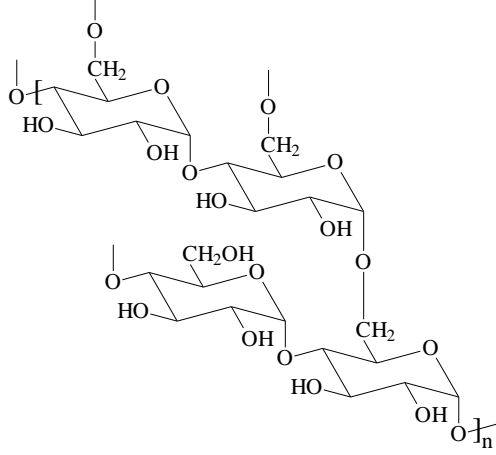
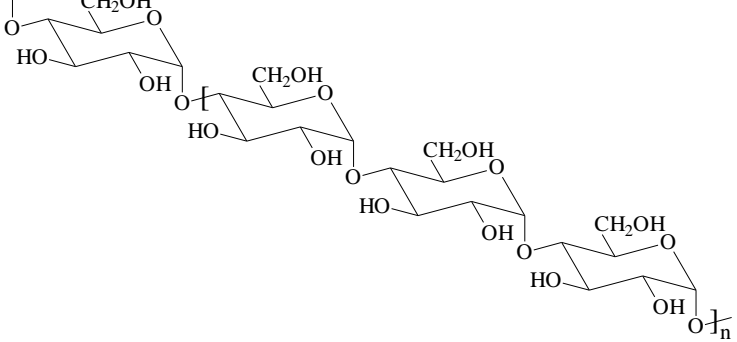
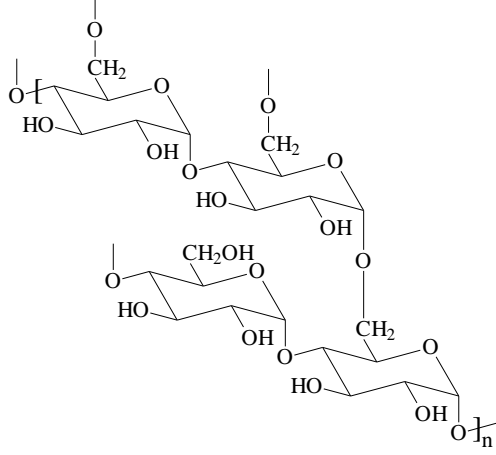
## 2. Alkohole/Phenole

Methanol	$\text{H}_3\text{C}-\text{OH}$
Ethanol	$\text{H}_3\text{C}-\text{CH}_2-\text{OH}$
Propan-1-ol $\equiv$ n-Propanol	$\text{H}_3\text{C}-\text{CH}_2-\text{CH}_2-\text{OH}$
Propan-2-ol (iso-Propanol)	$\begin{array}{c} \text{OH} \\   \\ \text{H}_3\text{C}-\text{CH}-\text{CH}_3 \end{array}$
Butan-1-ol $\equiv$ n-Butanol	$\text{H}_3\text{C}-\text{CH}_2-\text{CH}_2-\text{CH}_2-\text{OH}$
Butan-2-ol (2-Butanol)	$\begin{array}{c} \text{OH} \\   \\ \text{H}_3\text{C}-\text{CH}-\text{CH}_2-\text{CH}_3 \end{array}$
2-Methyl-propan-1-ol (2-Methyl-1-propanol) $\equiv$ Isobutylalkohol	$\begin{array}{c} \text{CH}_3 \\   \\ \text{HO}-\text{CH}_2-\text{CH}-\text{CH}_3 \end{array}$
2-Methyl-propan-2-ol (2-Methyl-2-propanol)	$\begin{array}{c} \text{CH}_3 \\   \\ \text{H}_3\text{C}-\text{C}-\text{CH}_3 \\   \\ \text{OH} \end{array}$
Glykol $\equiv$ Ethan-1,2-diol	$\begin{array}{c} \text{H}_2\text{C}-\text{OH} \\   \\ \text{H}_2\text{C}-\text{OH} \end{array}$
Glycerin (Glycerol) $\equiv$ Propan-1,2,3-triol	$\begin{array}{c} \text{H}_2\text{C}-\text{OH} \\   \\ \text{HC}-\text{OH} \\   \\ \text{H}_2\text{C}-\text{OH} \end{array}$
Phenol	
Hydrochinon	
Cholesterin (Cholesterol)? -nur erkennen-	

### 3. Kohlenhydrate

Monosaccharide	
D-Ribose	$  \begin{array}{c}  \text{H} \\    \\  \text{C}=\text{O} \\    \\  \text{H}-\text{C}-\text{OH} \\    \\  \text{H}-\text{C}-\text{OH} \\    \\  \text{H}-\text{C}-\text{OH} \\    \\  \text{CH}_2\text{OH}  \end{array}  $
D-Desoxyribose	$  \begin{array}{c}  \text{H} \\    \\  \text{C}=\text{O} \\    \\  \text{CH}_2 \\    \\  \text{H}-\text{C}-\text{OH} \\    \\  \text{H}-\text{C}-\text{OH} \\    \\  \text{CH}_2\text{OH}  \end{array}  $
D-Glucose (Glc)	$  \begin{array}{c}  \text{H} \\    \\  \text{C}=\text{O} \\    \\  \text{H}-\text{C}-\text{OH} \\    \\  \text{HO}-\text{C}-\text{H} \\    \\  \text{H}-\text{C}-\text{OH} \\    \\  \text{H}-\text{C}-\text{OH} \\    \\  \text{CH}_2\text{OH}  \end{array}  \equiv  \begin{array}{c}  \text{CH}_2\text{OH} \\    \\  \text{HO}-\text{C}-\text{O} \\    \quad   \\  \text{HO} \quad \text{OH} \\    \\  \text{OH}  \end{array}  \equiv  \begin{array}{c}  \text{CH}_2\text{OH} \\    \\  \text{HO}-\text{C}-\text{O} \\    \quad   \\  \text{HO} \quad \text{OH} \\    \\  \text{OH}  \end{array}  $
D-Galactose(Gal)	$  \begin{array}{c}  \text{H} \\    \\  \text{C}=\text{O} \\    \\  \text{H}-\text{C}-\text{OH} \\    \\  \text{HO}-\text{C}-\text{H} \\    \\  \text{HO}-\text{C}-\text{H} \\    \\  \text{H}-\text{C}-\text{OH} \\    \\  \text{CH}_2\text{OH}  \end{array}  \equiv  \begin{array}{c}  \text{CH}_2\text{OH} \\    \\  \text{HO}-\text{C}-\text{O} \\    \quad   \\  \text{HO} \quad \text{OH} \\    \\  \text{OH}  \end{array}  \equiv  \begin{array}{c}  \text{CH}_2\text{OH} \\    \\  \text{HO}-\text{C}-\text{O} \\    \quad   \\  \text{HO} \quad \text{OH} \\    \\  \text{OH}  \end{array}  $
D-Mannose	$  \begin{array}{c}  \text{H} \\    \\  \text{C}=\text{O} \\    \\  \text{HO}-\text{C}-\text{H} \\    \\  \text{HO}-\text{C}-\text{H} \\    \\  \text{H}-\text{C}-\text{OH} \\    \\  \text{H}-\text{C}-\text{OH} \\    \\  \text{CH}_2\text{OH}  \end{array}  \equiv  \begin{array}{c}  \text{CH}_2\text{OH} \\    \\  \text{HO}-\text{C}-\text{O} \\    \quad   \\  \text{HO} \quad \text{HO} \\    \\  \text{OH}  \end{array}  \equiv  \begin{array}{c}  \text{CH}_2\text{OH} \\    \\  \text{HO}-\text{C}-\text{O} \\    \quad   \\  \text{HO} \quad \text{OH} \\    \\  \text{OH}  \end{array}  $
D-Fructose (Fru)	$  \begin{array}{c}  \text{CH}_2\text{OH} \\    \\  \text{C}=\text{O} \\    \\  \text{HO}-\text{C}-\text{H} \\    \\  \text{H}-\text{C}-\text{OH} \\    \\  \text{H}-\text{C}-\text{OH} \\    \\  \text{CH}_2\text{OH}  \end{array}  $
Glucuronsäure	$  \begin{array}{c}  \text{H} \\    \\  \text{C}=\text{O} \\    \\  \text{H}-\text{C}-\text{OH} \\    \\  \text{HO}-\text{C}-\text{H} \\    \\  \text{H}-\text{C}-\text{OH} \\    \\  \text{H}-\text{C}-\text{OH} \\    \\  \text{COOH}  \end{array}  \equiv  \begin{array}{c}  \text{COOH} \\    \\  \text{HO}-\text{C}-\text{O} \\    \quad   \\  \text{HO} \quad \text{OH} \\    \\  \text{OH}  \end{array}  $
Glucosamin	$  \begin{array}{c}  \text{CH}_2\text{OH} \\    \\  \text{HO}-\text{C}-\text{O} \\    \quad   \\  \text{HO} \quad \text{OH} \\    \\  \text{NH}_2  \end{array}  $

<p>Gluconolacton -nur erkennen-</p>	
<p>Gluconsäure</p>	$  \begin{array}{c}  \text{COOH} \\    \\  \text{H}-\text{C}-\text{OH} \\    \\  \text{HO}-\text{C}-\text{H} \\    \\  \text{H}-\text{C}-\text{OH} \\    \\  \text{H}-\text{C}-\text{OH} \\    \\  \text{CH}_2\text{OH}  \end{array}  $
<p>N-Acetyl-glucosamin</p>	
<p>Sorbit</p>	$  \begin{array}{c}  \text{CH}_2\text{OH} \\    \\  \text{H}-\text{C}-\text{OH} \\    \\  \text{HO}-\text{C}-\text{H} \\    \\  \text{H}-\text{C}-\text{OH} \\    \\  \text{H}-\text{C}-\text{OH} \\    \\  \text{CH}_2\text{OH}  \end{array}  $
<p>N-Acetylneuraminsäure -nur erkennen-</p>	 <p style="text-align: center;">R = <math>\begin{array}{c} \text{CH}-\text{CH}-\text{CH}_2\text{OH} \\   \quad   \\ \text{OH} \quad \text{OH} \end{array}</math></p>
<p><b>Disaccharide</b></p>	
<p>Maltose (<math>\alpha</math>-Glc-1,4-Glc) -Verknüpfung und Bausteine merken-</p>	
<p>Isomaltose (<math>\alpha</math>-Glc-1,6-Glc) -Verknüpfung und Bausteine merken-</p>	

<p>Saccharose (<math>\alpha</math>-Glc-1,2-<math>\beta</math>-Fru)</p>	
<p>Lactose (<math>\beta</math>-Gal-1,4-Glc)</p>	
<p><b>Polysaccharide - nur Bausteine und Verknüpfung-</b></p>	
<p>Glykogen (Glc <math>\alpha</math>-1,4 und <math>\alpha</math>-1,6)  (stärker verzweigt als Amylopektin, sehr hohe Molmasse)  M: 5-15 Mill.  (auf 8-16 gleiche Bausteine eine verzweigte Stelle)</p>	
<p>Stärke (Amylose und Amylopektin)</p>	
<p>Amylose (Glc <math>\alpha</math>-1,4)  M: 50000-160000</p>	
<p>Amylopektin (Glc <math>\alpha</math>-1,4 und <math>\alpha</math>-1,6)  (auf 18-27 Monosaccharid-Bausteine eine Verzweigungsstelle)  M: 400000</p>	

Cellulose (Glc $\beta$ -1,4)	
Dextran (Glc $\alpha$ -1,3, $\alpha$ -1,4 und $\alpha$ -1,6)	
Inulin (Fru $\beta$ -glykosidisch)	

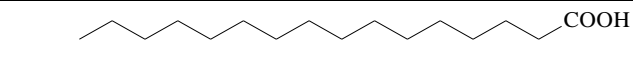
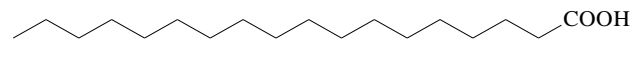
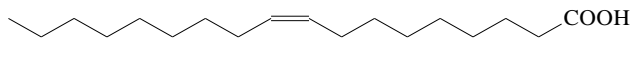
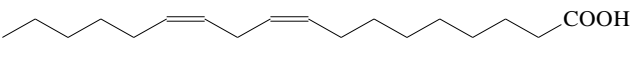
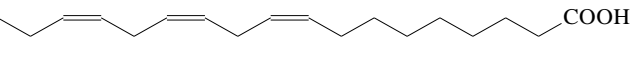
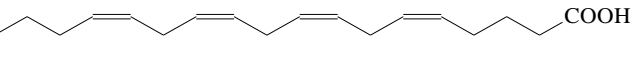
#### 4. Aminosäuren

Glycin (Gly)	$\begin{array}{c} \text{HOOC}-\text{CH}_2 \\   \\ \text{NH}_2 \end{array}$
$\beta$ -Alanin	$\begin{array}{c} \text{HOOC}-\text{CH}_2-\text{CH}_2 \\   \\ \text{NH}_2 \end{array}$
Alanin (Ala)	$\begin{array}{c} \text{HOOC}-\text{CH}-\text{CH}_3 \\   \\ \text{NH}_2 \end{array}$
Valin (Val)	$\begin{array}{c} \text{CH}_3 \\   \\ \text{HOOC}-\text{CH}-\text{CH}-\text{CH}_3 \\   \\ \text{NH}_2 \end{array}$
Leucin (Leu)	$\begin{array}{c} \text{CH}_3 \\   \\ \text{HOOC}-\text{CH}-\text{CH}_2-\text{CH}-\text{CH}_3 \\   \\ \text{NH}_2 \end{array}$
Isoleucin (Ile)	$\begin{array}{c} \text{CH}_3 \\   \\ \text{HOOC}-\text{CH}-\text{CH}-\text{CH}_2-\text{CH}_3 \\   \\ \text{NH}_2 \end{array}$
Serin (Ser)	$\begin{array}{c} \text{HOOC}-\text{CH}-\text{CH}_2-\text{OH} \\   \\ \text{NH}_2 \end{array}$
Threonin (Thr)	$\begin{array}{c} \text{OH} \\   \\ \text{HOOC}-\text{CH}-\text{CH}-\text{CH}_3 \\   \\ \text{NH}_2 \end{array}$

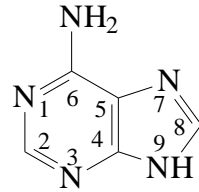
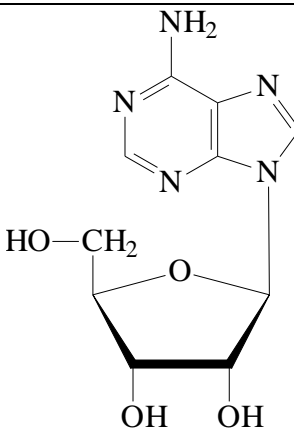
Cystein (Cys)	$\begin{array}{c} \text{HOOC}-\text{CH}-\text{CH}_2-\text{SH} \\   \\ \text{NH}_2 \end{array}$
Cystin	$\begin{array}{c} \text{HOOC}-\text{CH}-\text{CH}_2-\text{S}-\text{S}-\text{CH}_2-\text{CH}-\text{COOH} \\   \qquad \qquad \qquad   \\ \text{NH}_2 \qquad \qquad \qquad \text{NH}_2 \end{array}$
Methionin (Met)	$\begin{array}{c} \text{HOOC}-\text{CH}-\text{CH}_2-\text{CH}_2-\text{S}-\text{CH}_3 \\   \\ \text{NH}_2 \end{array}$
Arginin (Arg)	$\begin{array}{c} \text{HOOC}-\text{CH}-\text{CH}_2-\text{CH}_2-\text{CH}_2-\text{NH}-\text{C}=\text{NH} \\   \qquad \qquad \qquad \qquad \qquad   \\ \text{NH}_2 \qquad \qquad \qquad \qquad \qquad \text{NH}_2 \end{array}$
Lysin (Lys)	$\begin{array}{c} \text{HOOC}-\text{CH}-\text{CH}_2-\text{CH}_2-\text{CH}_2-\text{CH}_2-\text{NH}_2 \\   \\ \text{NH}_2 \end{array}$
Asparagin (Asn)	$\begin{array}{c} \text{HOOC}-\text{CH}-\text{CH}_2-\text{CONH}_2 \\   \\ \text{NH}_2 \end{array}$
Asparaginsäure (Asp)	$\begin{array}{c} \text{HOOC}-\text{CH}-\text{CH}_2-\text{COOH} \\   \\ \text{NH}_2 \end{array}$
Glutamin (Gln)	$\begin{array}{c} \text{HOOC}-\text{CH}-\text{CH}_2-\text{CH}_2-\text{CONH}_2 \\   \\ \text{NH}_2 \end{array}$
Glutaminsäure (Glu)	$\begin{array}{c} \text{HOOC}-\text{CH}-\text{CH}_2-\text{CH}_2-\text{COOH} \\   \\ \text{NH}_2 \end{array}$
Phenylalanin (Phe)	$\begin{array}{c} \text{HOOC}-\text{CH}-\text{CH}_2-\text{C}_6\text{H}_5 \\   \\ \text{NH}_2 \end{array}$
Tyrosin (Tyr)	$\begin{array}{c} \text{HOOC}-\text{CH}-\text{CH}_2-\text{C}_6\text{H}_4-\text{OH} \\   \\ \text{NH}_2 \end{array}$
Prolin (Pro)	$\begin{array}{c} \text{HOOC} \\   \\ \text{HN} \\   \\ \text{C}_4\text{H}_7 \end{array}$
Histidin (His)	$\begin{array}{c} \text{HOOC}-\text{CH}-\text{CH}_2-\text{C}_4\text{H}_3\text{N}_2 \\   \\ \text{NH}_2 \end{array}$
Tryptophan (Trp)	$\begin{array}{c} \text{HOOC}-\text{CH}-\text{CH}_2-\text{C}_8\text{H}_6\text{N}_2 \\   \\ \text{NH}_2 \end{array}$
Ornithin	$\begin{array}{c} \text{HOOC}-\text{CH}-\text{CH}_2-\text{CH}_2-\text{CH}_2-\text{NH}_2 \\   \\ \text{NH}_2 \end{array}$

Citrullin	$\text{HOOC}-\underset{\text{NH}_2}{\text{CH}}-\text{CH}_2-\text{CH}_2-\text{CH}_2-\text{NH}-\overset{\text{O}}{\parallel}{\text{C}}-\text{NH}_2$
$\gamma$ -Aminobuttersäure (GABA)	$\text{HOOC}-\underset{\text{NH}_2}{\text{CH}}-\text{CH}_2-\text{CH}_3$

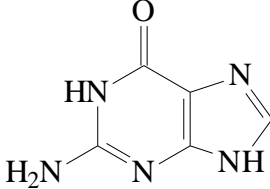
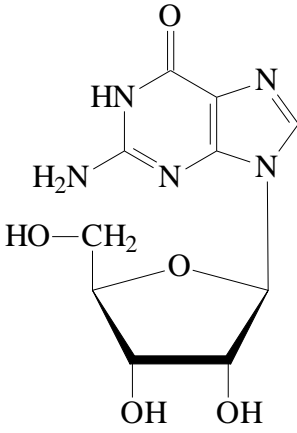
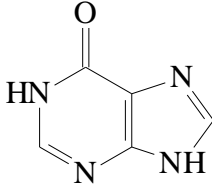
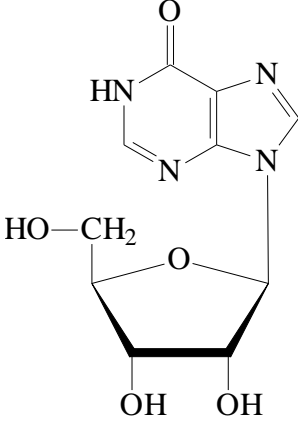
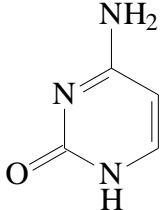
## 5. Fette/Fettsäuren

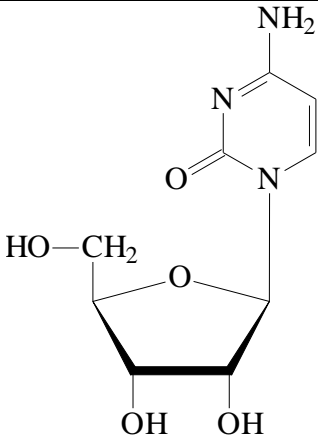
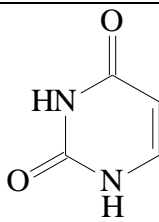
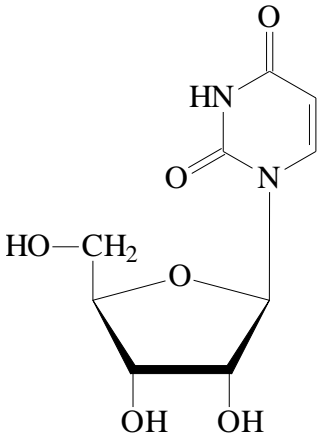
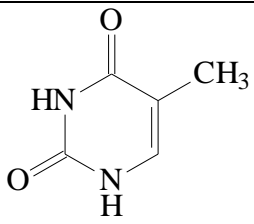
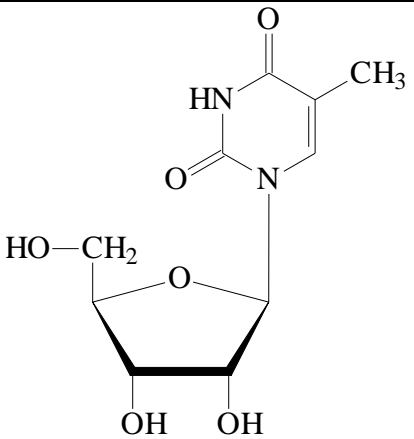
Palmitinsäure (Palmitat) $\equiv$ Hexadecansäure(FS)	
Stearinsäure (Stearat) $\equiv$ Octadecansäure(FS)	
Ölsäure (Oleat) $\equiv$ cis-Octadec-9- ensäure $\equiv$ Oleinsäure(FS)	
Linolsäure $\equiv$ Z,Z-Octadec-9,12- diensäure(FS)	
Linolensäure $\equiv$ Z,Z,Z-Octadeca- 9,12,15-triensäure(FS)	
Arachidonsäure $\equiv$ Z,Z,Z,Z-Eicosa- 5,8,11,14-tetraensäure(FS)	

## 6.1 Nucleoside -Strukturen erkennen-

<b>Purin-Derivate</b>	
Adenin (Ade)	
Adenosin (A)	

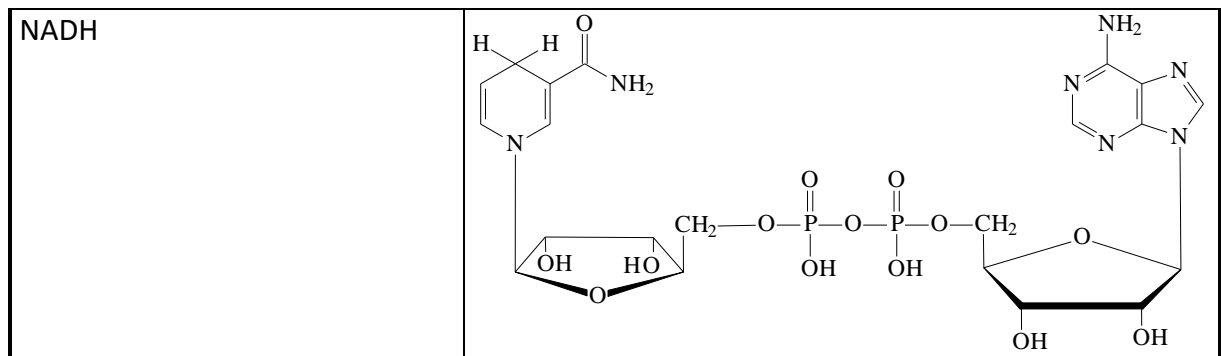


Guanin (Gua)	
Guanosin (G)	
Hypoxanthin (Hyp)	
Inosin (I)	
<b>Pyrimidin-Derivate</b> -Strukturen erkennen-	
Cytosin (Cyt)	

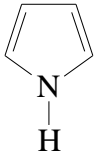
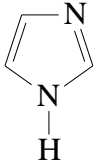
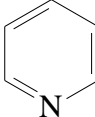
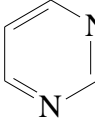
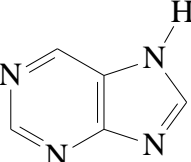
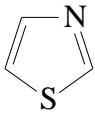
Cytidin (C)	 <p>Chemical structure of Cytidin (C): A pyrimidine ring with an amino group (NH<sub>2</sub>) at position 4 and a carbonyl group (C=O) at position 2, attached to a ribose sugar at position 1.</p>
Uracil (Ura)	 <p>Chemical structure of Uracil (Ura): A pyrimidine ring with carbonyl groups (C=O) at positions 2 and 4, and NH groups at positions 1 and 3.</p>
Uridin (U)	 <p>Chemical structure of Uridin (U): A pyrimidine ring with carbonyl groups (C=O) at positions 2 and 4, attached to a ribose sugar at position 1.</p>
Thymin (Thy)	 <p>Chemical structure of Thymin (Thy): A pyrimidine ring with carbonyl groups (C=O) at positions 2 and 4, an NH group at position 1, and a methyl group (CH<sub>3</sub>) at position 5.</p>
Thymidin (dT)	 <p>Chemical structure of Thymidin (dT): A pyrimidine ring with carbonyl groups (C=O) at positions 2 and 4, an NH group at position 1, a methyl group (CH<sub>3</sub>) at position 5, and attached to a ribose sugar at position 1.</p>

## 6.2 Nucleotide -Strukturen erkennen, Bausteine u. deren Verknüpfung kennen-

Adenosinmonophosphat (AMP)	
Adenosindiphosphat (ADP)	
Adenosintriphosphat (ATP)	
Nicotinamidadenindinucleotid (NAD <sup>+</sup> )	



### 7. Heterocyclen -nur erkennen-

Pyrrol	
Imidazol	
Pyridin	
Pyrimidin	
7H-Purin	
Thiazol	
Indol	