



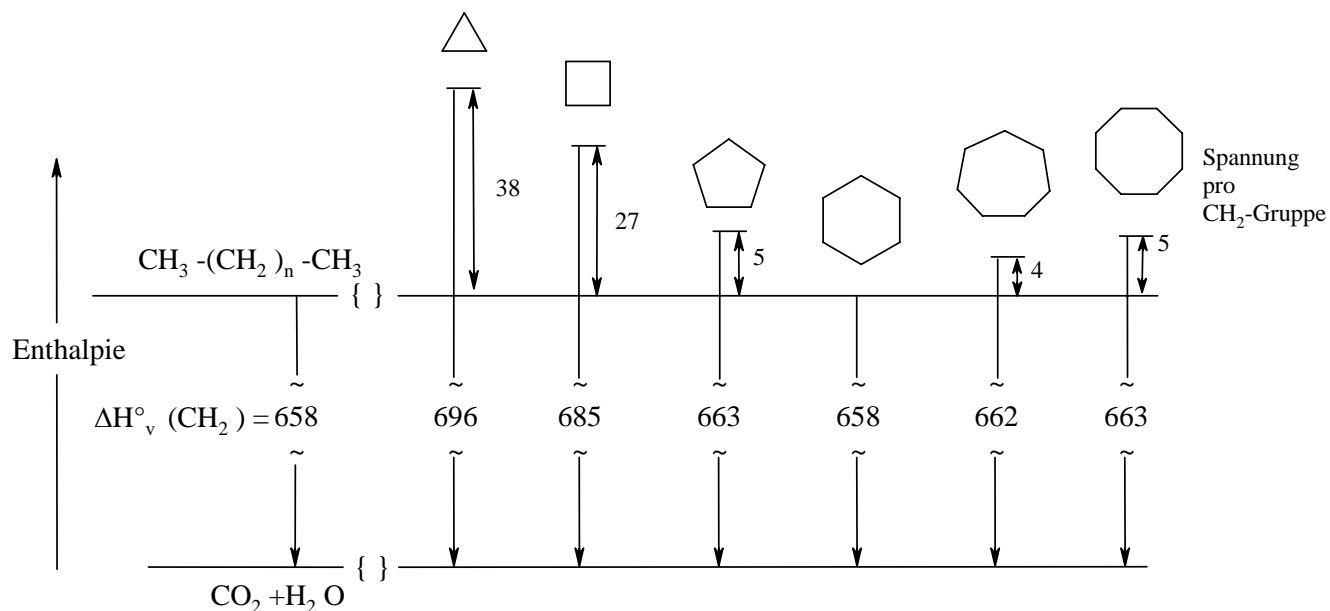








Homologe Reihe der Cycloalkane  $C_nH_{2n}$ 

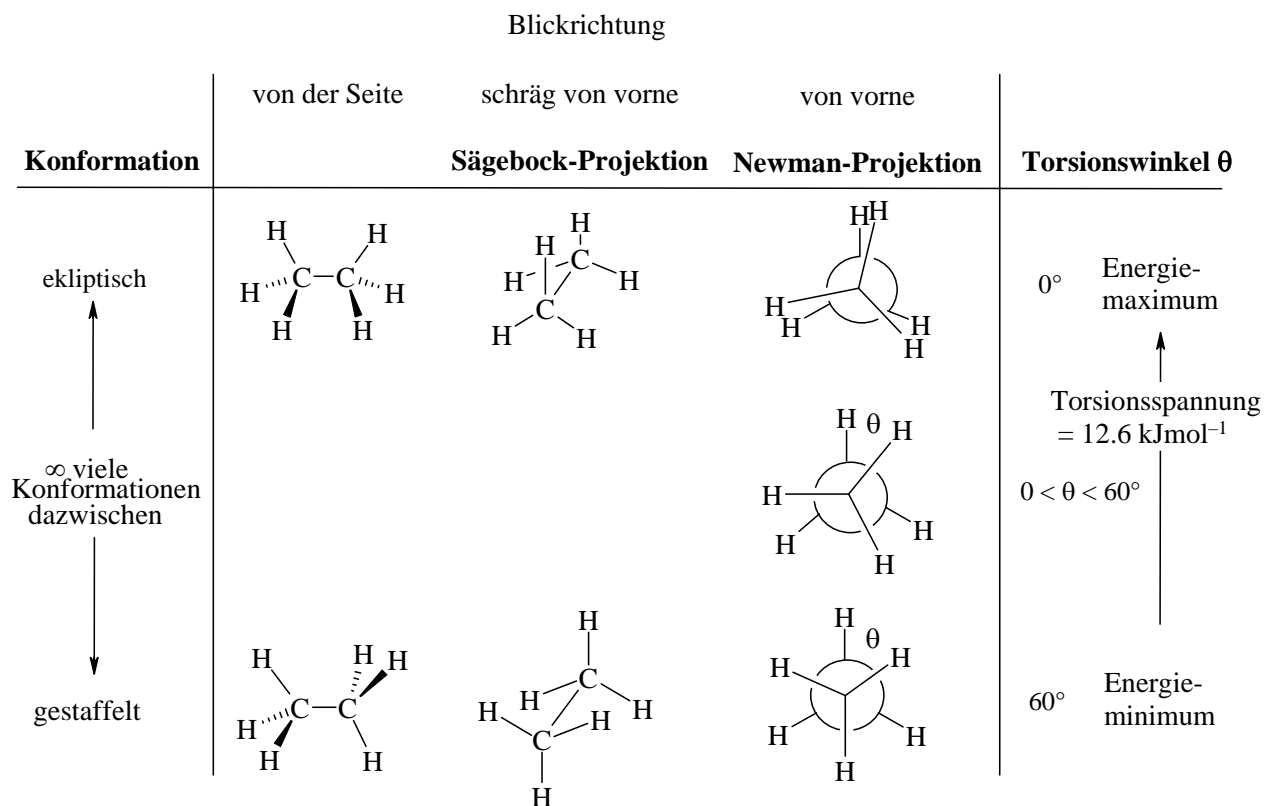
Name	Konstitution	
	Ausführliche Schreibweise	Stenographie
Vorsilbe    Endsilbe ↓            ↓ Cyclo <b>pro</b> pan	$\begin{array}{c} \text{H}_2 \\   \\ \text{C} \\ / \quad \backslash \\ \text{H}_2\text{C} - \text{CH}_2 \end{array}$	
Cyclo <b>but</b> an	$\begin{array}{c} \text{H}_2\text{C} - \text{CH}_2 \\   \quad   \\ \text{H}_2\text{C} - \text{CH}_2 \end{array}$	
Cyclo <b>pent</b> an	$\begin{array}{c} \text{H}_2 \\   \\ \text{C} \\ / \quad \backslash \\ \text{H}_2\text{C} \quad \text{CH}_2 \\   \quad   \\ \text{H}_2\text{C} - \text{CH}_2 \end{array}$	
Cyclo <b>hex</b> an	$\begin{array}{c} \text{H}_2 \\   \\ \text{C} \\ / \quad \backslash \\ \text{H}_2\text{C} \quad \text{CH}_2 \\   \quad   \\ \text{H}_2\text{C} \quad \text{CH}_2 \\   \\ \text{C} \\   \\ \text{H}_2 \end{array}$	
und so weiter		

Verbrennungsenthalpie pro  $\text{CH}_2$ -Gruppe  $\Delta H^\circ_v(\text{CH}_2)$   
 und Spannung  $\Delta H^\circ_s$  [ $\text{kJ mol}^{-1}$ ] von Cycloalkanen



						
Spannung $\Delta H^\circ_s$	115	109	27	0	26	40
Abweichung der Bindungswinkel vom idealen Tetraederwinkel	$109^\circ - 60^\circ = 49^\circ$	$109^\circ - 90^\circ = 19^\circ$	—	—	—	—

## Konformationen des Ethans

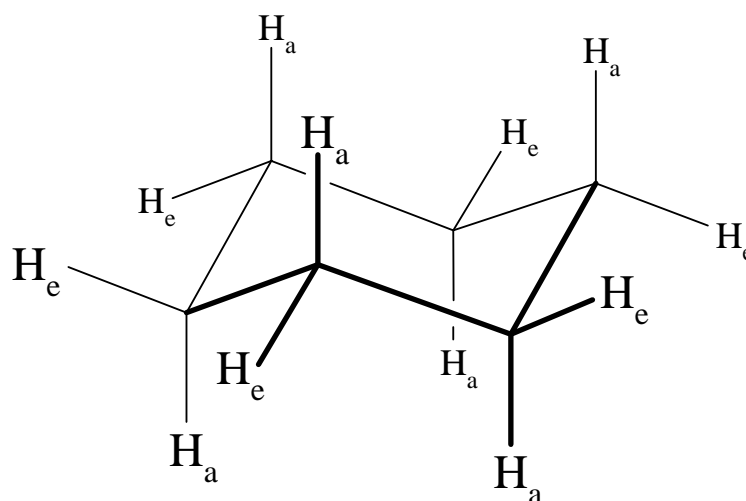
Winkelspannung und Torsionsspannung von Cycloalkanen [ $\text{kJ mol}^{-1}$ ]

Winkeldeformation <sup>a)</sup>	$49^\circ$	$19^\circ$	—	—	—
Winkelspannung	78	71	—	—	—
Torsionsspannung	38	38	27	—	26
Gesamtspannung	116	109	27	—	26

<sup>a)</sup> = Abweichung der Bindungswinkel vom idealen Tetraederwinkel

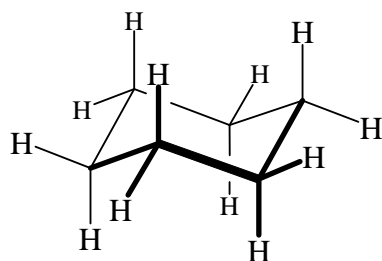
## 4.05

**Axiale ( $H_a$ ) und äquatoriale Stellung ( $H_e$ )  
der Wasserstoffatome an Cyclohexanringen  
in der Sesselkonformation**

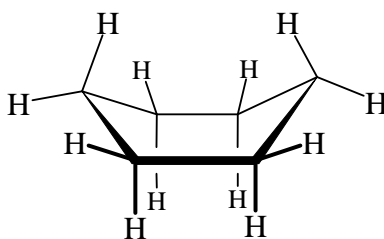


## 4.06

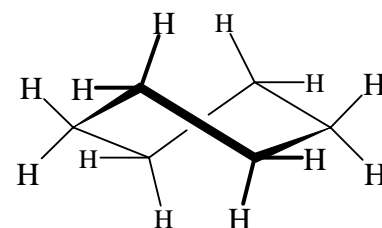
**Konformationen des Cyclohexans**



Sessel-Konformation  
(tiefstes Energieminimum)

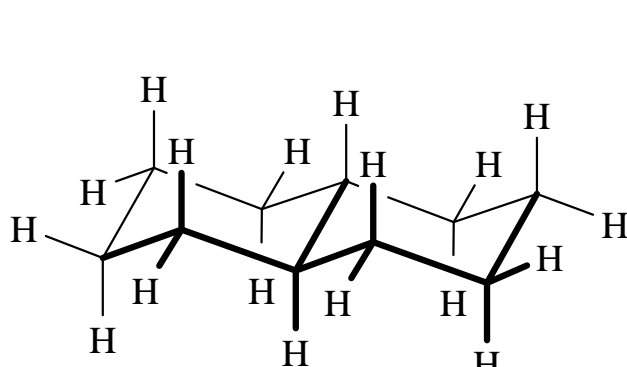


Boot-Konformation  
(Wannen-Konformation)  
(Energimaximum)

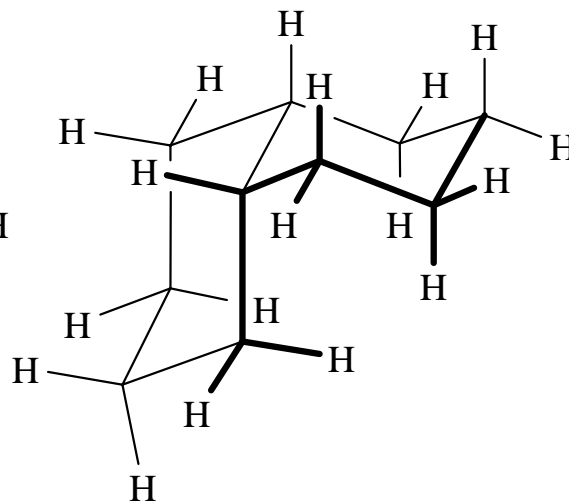


Twistboot-Konformation  
(Energieminimum)

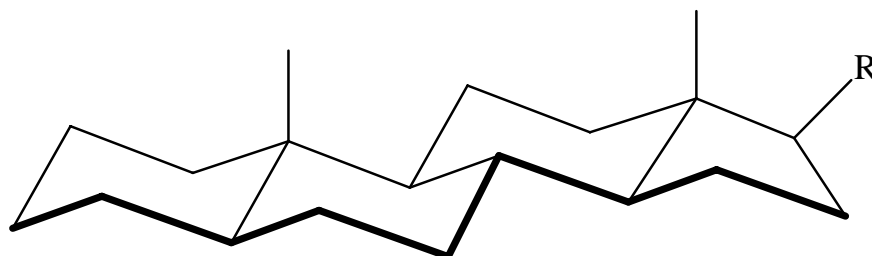
## Decalin- und Steroidgerüst



*trans*-Decahydronaphthalin  
(*trans*-Decalin)



*cis*-Decahydronaphthalin  
(*cis*-Decalin)



Grundgerüst der Steroide