

$$\left[\text{C}_4\text{H}_2 - \text{C}_4\text{H}_2 \right]_n \quad \overline{M}_n = 1.4 \times 10^5 \text{ g/mol}$$

$$\text{DP} = \frac{\overline{M}_n}{28} \approx 5000$$

$$\text{C} - \text{C} = 0.154 \text{ nm}$$

$$\text{No. of C-C} = \text{DP} \times 2$$

$$= 5000 \times 2$$

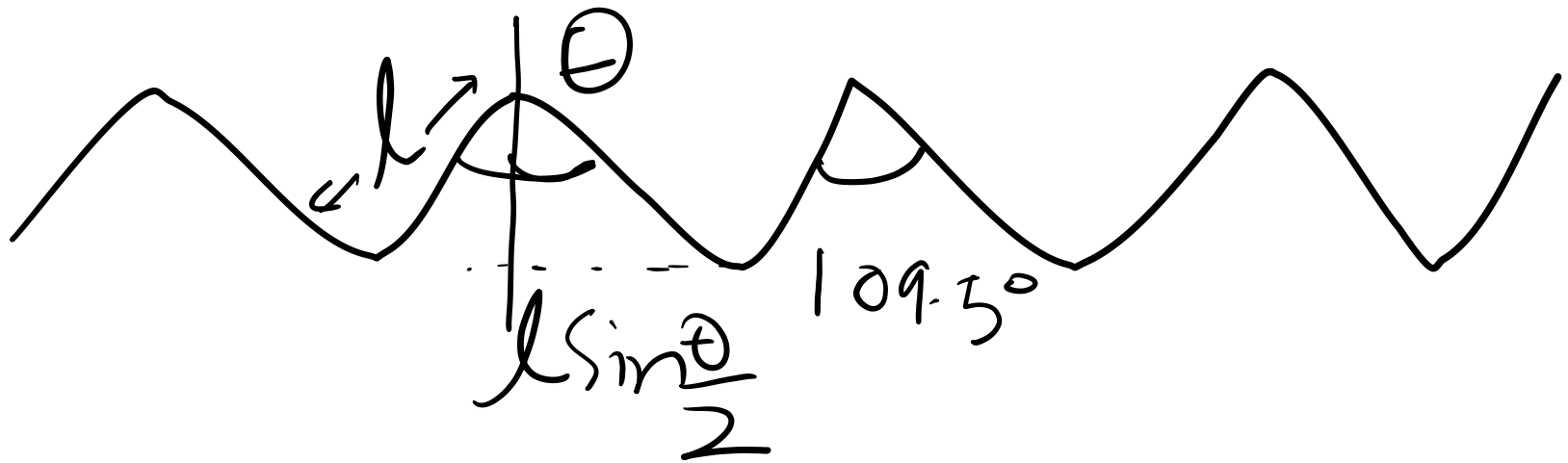
$$\approx 10,000 \text{ — } \underline{1}$$

5000 $\text{CH}_2=\text{CH}_2$

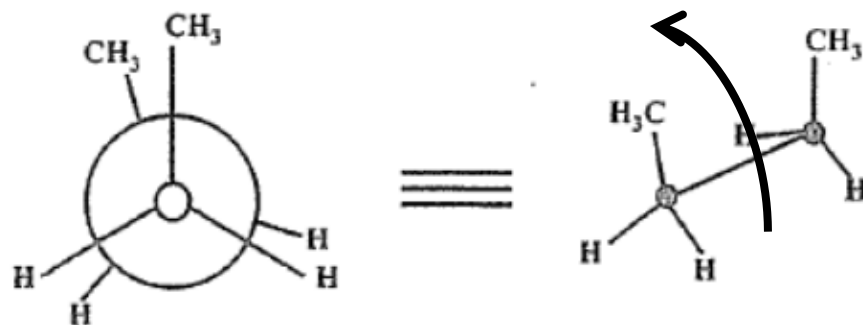
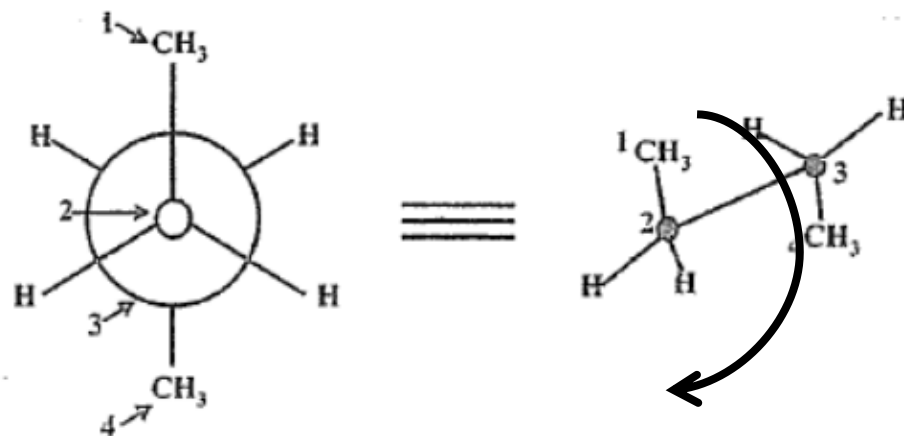


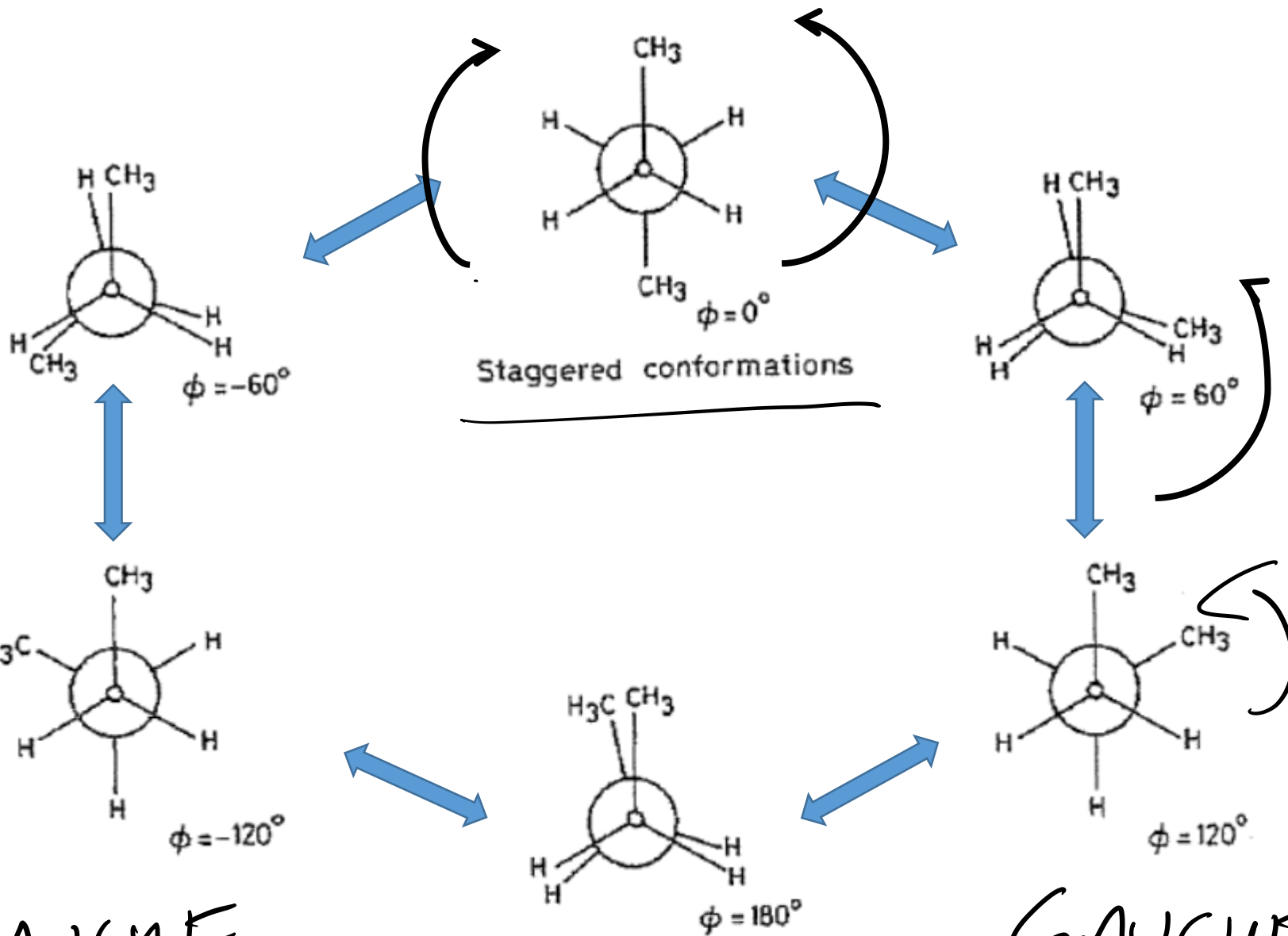
$l = 1540 \text{ mm}$ CONTOUR
LENGTH

-C-C-C-C-C-C-C-



$$r = 10,000 \times 0.154 \times \sin\left(\frac{109.5}{2}\right)$$
$$= 1258 \text{ mm}$$



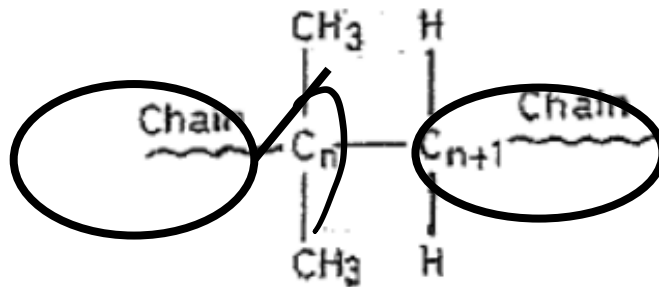


Staggered conformations

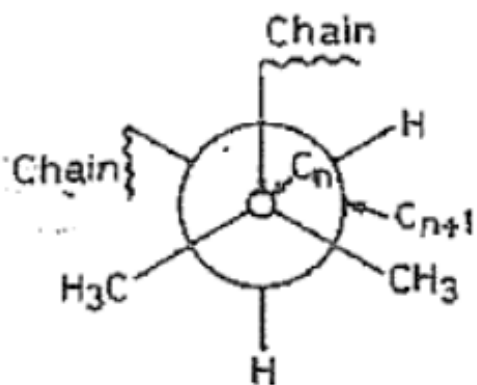
Eclipsed conformations

GAUCHE

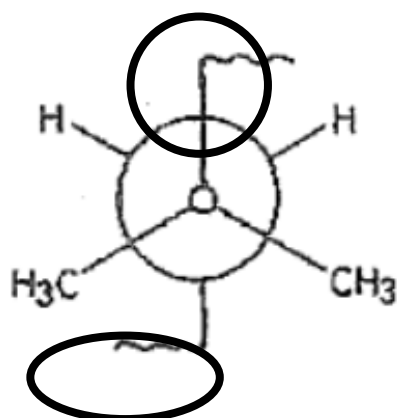
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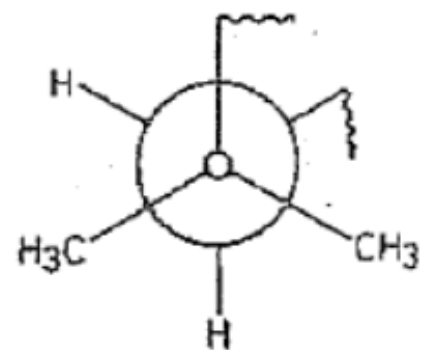
GAU CHE



Gauche



Trans or anti



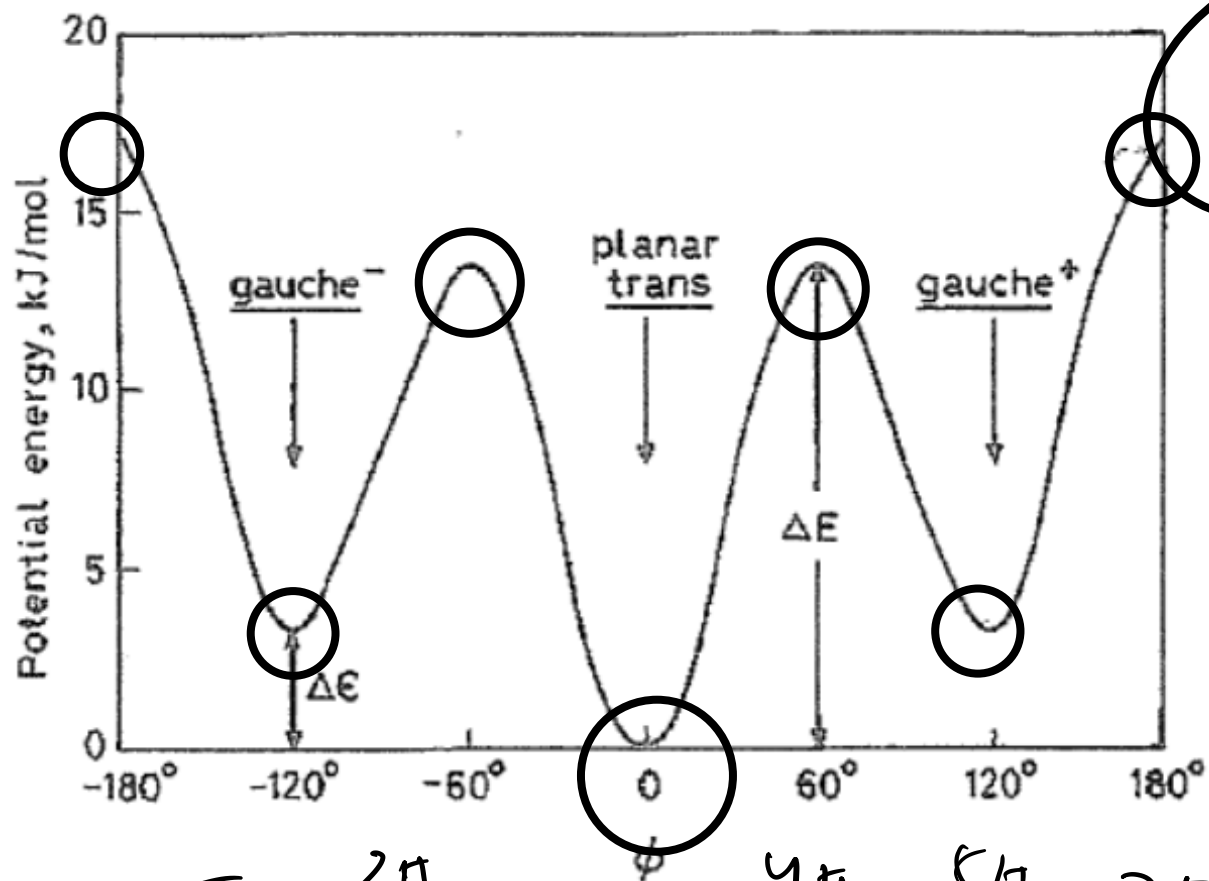
Gauche



ΔE



KT



KT

○ $\frac{\pi}{3}$ $\frac{2\pi}{3}$ π $\frac{4\pi}{3}$ $\frac{5\pi}{3}$ 2π

$$\frac{n_g}{n_T} = 2 \exp\left(\frac{-\Delta E}{kT}\right)$$

BOLTZMANN'S
DISTRIBUTION

$$\Delta E = 3.34 \text{ kJ/mol} / N_A$$

= kJ/mole

$$\frac{n_g}{n_T}$$

$$k = 1.38 \times 10^{-23} \text{ J/K}$$

$T = 100 \text{ K}$

$$\frac{n_g}{n_T} =$$

$$T = 100\text{K}$$

$$T = 300\text{K}$$

$$T = 500\text{K}$$





10000

C — C

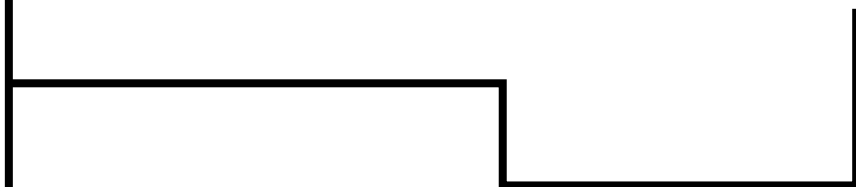
$\Delta 3$

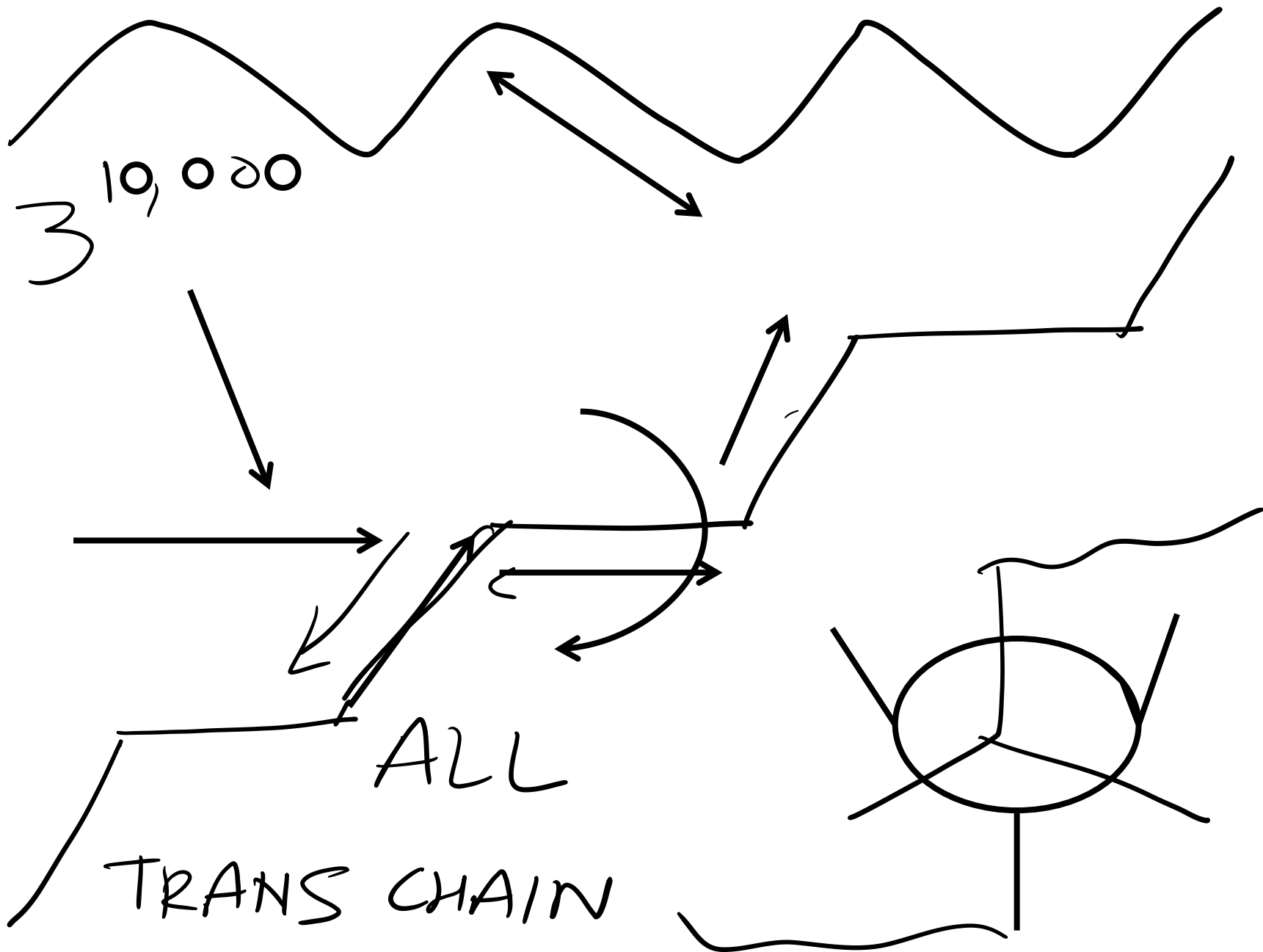
GAU ~~E~~ TRANS

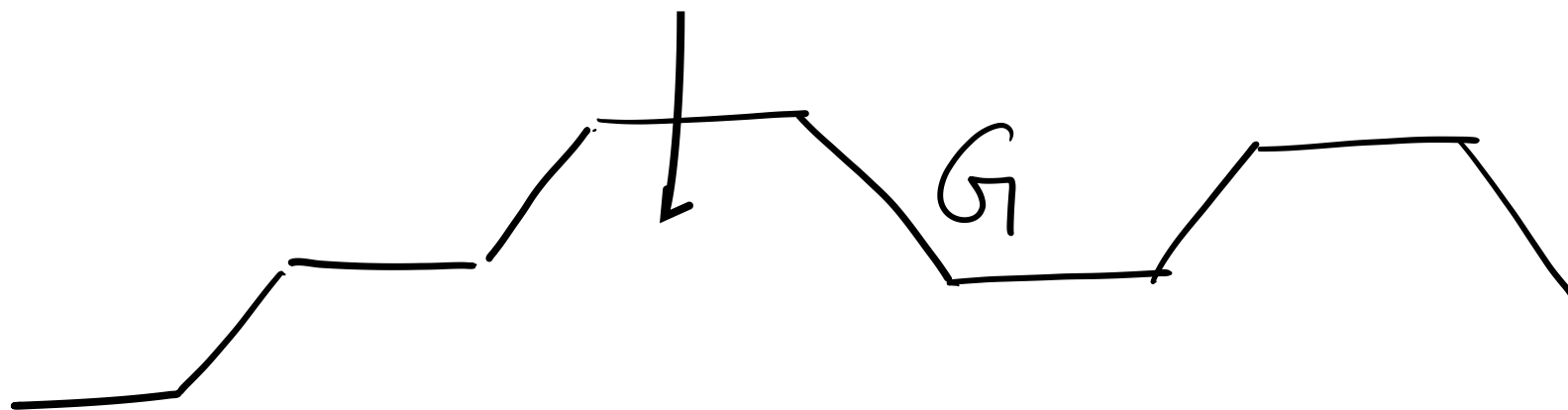
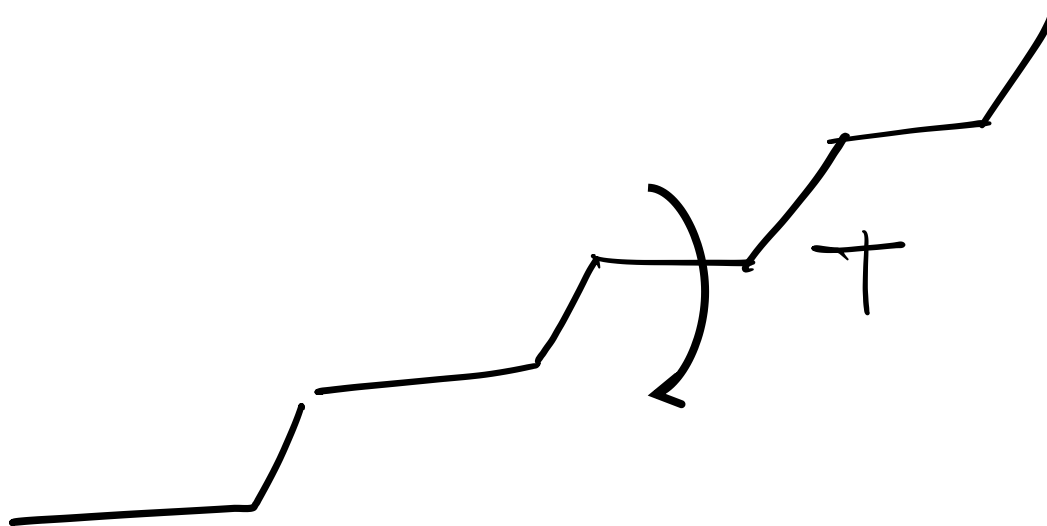
GAUCHE

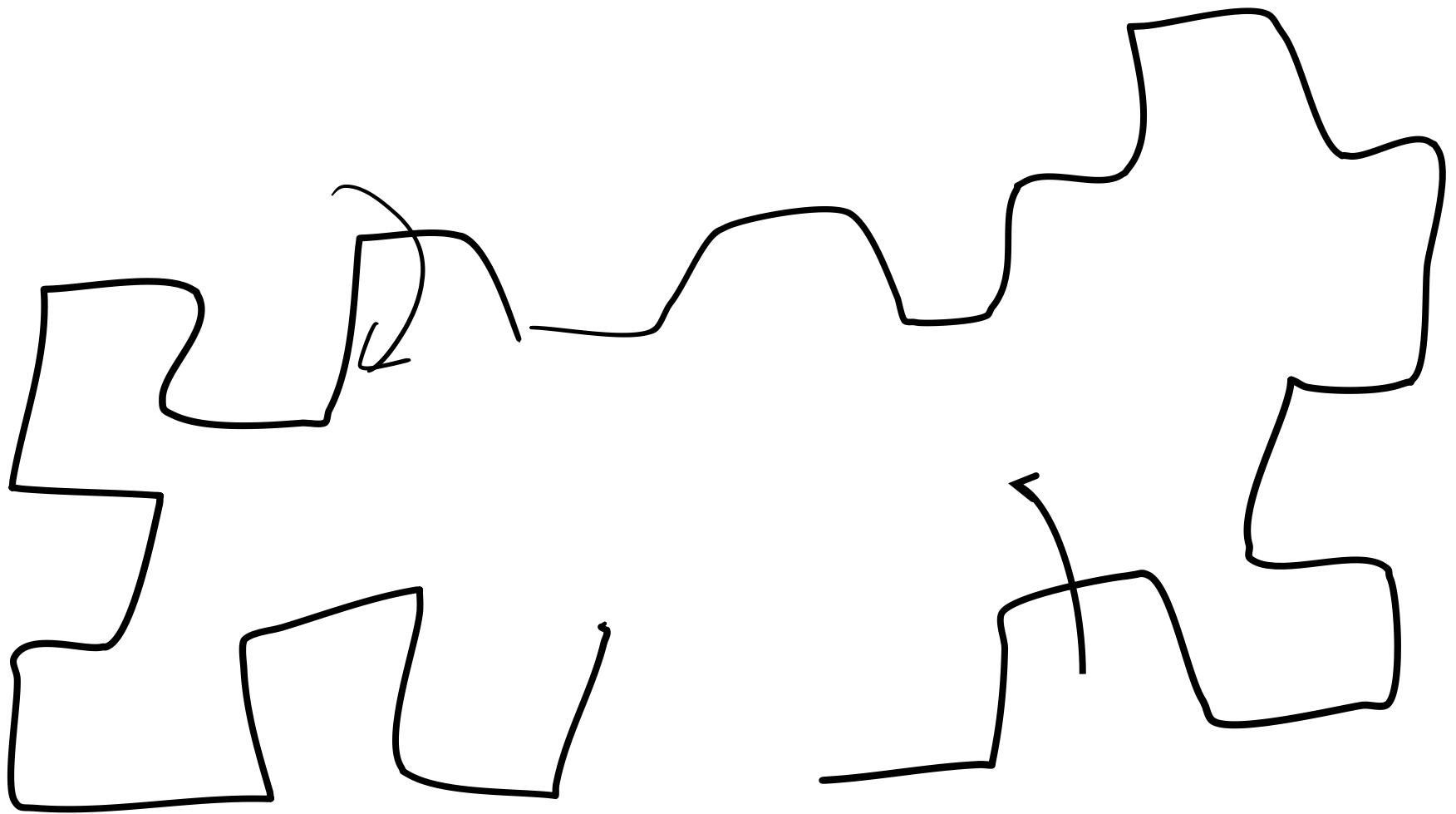
$T = 300K$

310,000









RANDOM COIL