Nahastura-entropia eta Gibbs-en paradoxa

$$S_i = N_i k \ln V_i + \frac{3}{2} N_i k \left\{ 1 + \ln \left(\frac{2\pi m_i kT}{h^2} \right) \right\}; \qquad i = 1, 2$$ i

$$S_T = \sum_{i=1}^{2} \left[N_i k \ln V + \frac{3}{2} N_i k \left\{ 1 + \ln \left(\frac{2\pi m_i kT}{h^2} \right) \right\} \right]$$ f

$\Delta S_{i \to f}$

$$(\Delta S) = S_T - \sum_{i=1}^{2} S_i = k \left[N_1 \ln \frac{V_1 + V_2}{V_1} + N_2 \ln \frac{V_1 + V_2}{V_2} \right]$$

$\Downarrow$ kasu berezia

$$(\Delta S)^* = k \left[N_1 \ln \frac{N_1 + N_2}{N_1} + N_2 \ln \frac{N_1 + N_2}{N_2} \right]$$ ✓

$$\boxed{S_T = Nk \ln V + \frac{3}{2} Nk \left\{ 1 + \ln \left(\frac{2\pi mkT}{h^2} \right) \right\}}$$

BERDINAK DIRENEAN

$$(\Delta S)^*_{1 \equiv 2} = 0 \quad \#$$

!! $(\Delta S)^* = S_T - (S_1 + S_2) \approx k \left[\ln \{ (N_1 + N_2)! \} - \ln(N_1!) - \ln(N_2!) \right]$!!

$\Downarrow$

$$\boxed{S(N, V, E) = Nk \left[\frac{V}{Nh^3} \left(\frac{4\pi mE}{3N} \right)^{3/2} \right] + \frac{5}{2} Nk}$$

$$= Nk \ln \left(\frac{V}{N} \right) + \frac{3}{2} Nk \left\{ \frac{5}{3} + \ln \left(\frac{2\pi mkT}{h^2} \right) \right\}$$

$$(\Delta S)_{1 \equiv 2} = k \left[(N_1 + N_2) \ln \left(\frac{V_1 + V_2}{N_1 + N_2} \right) - N_1 \ln \left(\frac{V_1}{N_1} \right) - N_2 \ln \left(\frac{V_2}{N_2} \right) \right]$$

$\uparrow$

$$(\Delta S)^*_{1 \equiv 2} = 0$$ Konpondute