

$$S = a^{1/3} N^{1/3} V^{1/3} E_i^{1/3}$$

$$\text{Siendo } a = \frac{C^2 N_*}{T_* V_*}$$

Aplicando las definiciones de T , P y μ

$$\frac{1}{T} = \left(\frac{\partial S}{\partial E_i} \right)_{V, N} = \frac{a^{1/3}}{3} N^{1/3} V^{1/3} E_i^{-2/3}$$

$$\frac{P}{T} = \left(\frac{\partial S}{\partial V} \right)_{E_i, N} = \frac{a^{1/3}}{3} N^{1/3} V^{-2/3} E_i^{1/3}$$

$$-\frac{\mu}{T} = \left(\frac{\partial S}{\partial N} \right)_{V, E_i} = \frac{a^{1/3}}{3} N^{-2/3} V^{1/3} E_i^{1/3}$$

Despejando

$$\mu = -\sqrt{\frac{a}{27} \frac{VT^3}{N}}$$

$$P = \sqrt{\frac{a}{27} \frac{NT^3}{V}}$$

$$PV^2 = \frac{S^3}{aN}$$