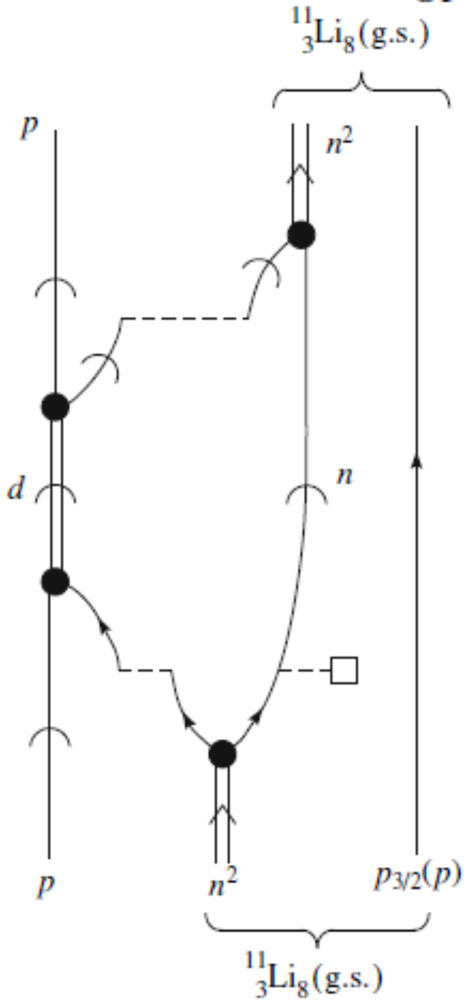
OPTICAL POTENTIAL



$$\sum_p (k,\omega) = \sum_{\text{int}} \frac{V^2_{p,\,\text{int}}}{\hbar\omega - E_{\text{int}}},$$

$$= \lim_{\Delta\to 0} \sum_{\text{int}} \frac{V^2_{p,\,\text{int}}}{(\hbar\omega - E_{\text{int}}) + i\Delta/2},$$

$$= \Delta E_p(k,\omega) - iW_p(k,\omega),$$

$$\Delta E_p(k,\omega) = \lim_{\Delta\to 0} \sum_{\text{int}} \frac{(\hbar\omega - E_{\text{int}})V^2_{p,\,\text{int}}}{(\hbar\omega - E_{\text{int}})^2 + \left(\frac{\Delta}{2}\right)^2},$$

$$W_p(k,\omega) = \lim_{\Delta\to 0} \sum_{\text{int}} \frac{\frac{\Delta}{2} V^2_{p,\,\text{int}}}{(\hbar\omega - E_{\text{int}})^2 + \left(\frac{\Delta}{2}\right)^2},$$

$$\Delta E_p(k,\omega) = U_p(k,\omega) = \frac{\mathcal{P}}{\pi}\int \frac{W_p(k,\omega)}{\omega - \omega'}\,d\omega'.$$

Kramers–Krönig