$$\sigma_s(\nu) = \frac{\sigma_{so}}{\beta^2}\left[\left(\beta^2 + \frac{1}{2}\right)erf(\beta) + \frac{1}{\sqrt{\pi}}\beta e^{-\beta^2}\right]$$

$$\frac{d\sigma_C}{d\Omega} = \frac{r_e^2}{4}\left(\frac{\omega'}{\omega}\right)^2\left[\frac{\omega}{\omega'} + \frac{\omega'}{\omega} - 2 + 4\cos^2\Theta\right]$$

$$\frac{d\sigma_C}{d\Omega} = \frac{r_e^2}{2}\left(1+\cos^2\theta\right)\left(\frac{1}{1+\alpha(1-\cos\theta)}\right)^2\left[1 + \frac{\alpha^2(1-\cos\theta)^2}{(1+\cos^2\theta)\left[1+\alpha(1-\cos\theta)\right]}\right]$$

$$\frac{d\sigma_\tau}{d\Omega} = 4\sqrt{2}\,\frac{r_e^2 Z^5}{(137)^4}\left(\frac{m_e c^2}{\hbar\omega}\right)^{7/2}\frac{\sin^2\theta\cos^2\varphi}{\left(1-\frac{v}{c}\cos\theta\right)^4}$$

$$\frac{d\sigma_\kappa}{dT_+} = 4\sigma_o Z^2\,\frac{T_+^2 + T_-^2 - \frac{2}{3}T_+T_-}{(\hbar\omega)^3}\left[\ell n\left(\frac{2T_+T_-}{\hbar\omega m_e c^2}\right) - \frac{1}{2}\right]$$

$$Q = T_3\left(1+\frac{M_3}{M_4}\right) - T_1\left(1-\frac{M_1}{M_4}\right) - \frac{2}{M_4}\left(M_1 M_3 T_1 T_3\right)^{1/2}\cos\theta$$

$$\sigma_C(T_i) = \pi\bar{\lambda}^2 g_J\,\frac{\Gamma_a\Gamma}{\left(T_i - T_i^*\right)^2 + \Gamma^2/4}$$

$$\gamma = \frac{8Z_D e^2}{\hbar v}\left[\cos^{-1}\sqrt{y} - \sqrt{y}(1-y)^{1/2}\right]$$

$$\sigma(n,n) = 4\pi a^2 + \pi\bar{\lambda}^2 g_J\,\frac{\Gamma_n^2}{\left(T_i - T_i^*\right)^2 + \Gamma^2/4} + 4\pi\bar{\lambda} g_J a\Gamma_n\,\frac{\left(T_i - T_i^*\right)}{\left(T_i - T_i^*\right)^2 + \Gamma^2/4}$$