4.5:

From Appendix 6, we have

$$g_{21} = \frac{\lambda_0^2}{8\pi n^2 \tau_{sp}^{21}} h\rho_r(E_{21})(f_2 - f_1) \qquad (A6.25)$$

From Chapter 4, we have

$$g_{21} = \frac{\pi q^2 \hbar}{n\epsilon_0 c m_0^2} \frac{1}{h\nu_{21}} |M_T(E_{21})|^2 \rho_r(E_{21})(f_2 - f_1)$$

Setting these equal, we have

$$\tau_{sp}^{21} = \frac{hc^3 m_0^2 \epsilon_0}{4\pi \nu_{21} q^2 n} \frac{1}{|M_T(E_{21})|^2}$$