1)

160(5): Electron Compton Scattering from Methane Gas

! As in note 159(10) we use the data of:
G. Cooper, A. P. Hitchcock, C. A Chatzidimitriou – Dreissen and M Vos, J. Electron Spec., 155, 28–34 (2007). The initial frequency is ω and is:

$$\omega = 2.5067 \times 10^{18} \text{ rad s}^{-1} \quad — (1)$$

The observed scattered frequencies are:

θ / rad	$\omega' / 10^{18}$ (rad s^{-1})
0.6981 (40°)	2.1967
0.8726 (50°)	2.1222
1.0908 (62.5°)	2.0355
1.3089 (75°)	1.9528
1.4835 (85°)	1.8908
1.74525 (100°)	1.8081

Masses

$$m_1 = 9.10953 \times 10^{-31} \text{ kg}$$
$$m_2 = 1.99 \times 10^{-26} \text{ kg}$$

m_1 = electron, m_2 = carbon atom.

Equation to be Tested

$$x_2 = \frac{\omega\omega'}{\omega' - \omega} - \left(\frac{x_1^2 + \left(\omega^2 - x_1^2\right)^{1/2}\left(\omega'^2 - x_1^2\right)^{1/2} \cos\theta}{\omega - \omega'} \right)$$

$$x_1 = \frac{m_1 c^2}{\hbar}, \quad x_2 = \frac{m_2 c^2}{\hbar}$$