NOTE ON WOO'S PAPER ON THE SCATTERING OF X-RAYS BY POLYATOMIC GASES

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WOO'S formulas (5) and (6) do not seem to me to be quite correct. When account is taken of the distinction between F and F' (that is, between f and f' in the notation used in the papers by Harvey and myself), formula (5) should read

$$I_{\phi n} = I_e \sum_1^n F_i'^2 + I_e \sum_1^n{}' \sum_1^n{}' F_i F_j \frac{\sin ks_{ij}}{ks_{ij}} + I_e \sum_1^n \frac{Z_i - F_i'^2/Z_i}{[1+\gamma(1-\cos\phi)]^3} \quad (5a)$$

where the symbol $\Sigma'\Sigma'$ indicates that in the summation $i \neq j$. As a result of this change in Eq. (5), Woo's formula (6) for diatomic gas molecules consisting of two like atoms becomes

$$S = \frac{I_{\phi 2}}{2ZI_e} = \frac{A^2}{Z} + \frac{\sin ks}{ks} \cdot \frac{F^2}{Z} + \frac{1 - A^2/Z^2}{[1+\gamma(1-\cos\phi)]^3} \cdot \quad (6a)$$

The difference between Woo's formula and my formula (7) in his paper is that his formula takes account of the Compton change of wave-length while mine does not. Hence Woo's formula should reduce to mine when $\gamma = 0$. It is seen that formula (6a) does reduce to my formula (7) in Woo's paper when $A = F'$ and $\gamma = 0$. As a result of using Eq. (6a) instead of Woo's Eq. (6), some of the values in the columns headed $A = F'$ for N_2 and O_2 in Woo's Table III are slightly changed. The greatest change, however, is less than one third of the difference between the values given in the columns headed $A = F$ and $A = F'$, so that Woo's conclusions are not affected by this slight change.