THE ULTRA VIOLET SPECTRUM OF TeO$_2$

DANIEL F HULLAH and JOHN M BROWN, The Physical and Theoretical Chemistry Laboratory, South Parks Road, Oxford, OX1 3QZ, UK.

The laser induced fluorescence spectrum of TeO$_2$ has been recorded between 345 nm and 405, using a high temperature nozzle source. The spectrum shows a considerable improvement in signal-to-noise ratio in comparison with that of Dubois$^1$ and this has lead to a reassignment of the vibrational structure, including the band origin.

To date, 58 vibrational bands (27 cold and 31 hot) have been reassigned to the $^3$B$_2$–$^1$A$_1$ electronic transition of TeO$_2$. The values of the band origin and the vibrational frequencies for the symmetric stretch ($\nu_1$) and bending ($\nu_2$) modes are given as follows (values are in cm$^{-1}$)

$$\nu_0=25526 \quad \nu_1=678 \quad \nu_2=220 \quad \omega'_1=822 \quad \omega'_2=281.$$

Measurements at high resolution are planned to allow a rotational analysis. Following on from this work, the products of the high temperature reaction Te + H$_2$O are to be investigated.

Reference