THE RELATIVE INTENSITY OF THE X-RAY LINE $L\gamma_6$ AS THE O_{IV} LEVELS ARE FILLED

JOHN N. COOPER, University of Oklahoma, Norman

The x-ray line $L\gamma_6$ arises from a transition $L_{II}O_{IV}$. For elements of atomic number less than 72, $L\gamma_6$ is either very weak or completely absent, since these elements have only one electron at most in an O_{IV} level. Between elements 72 (hafnium) and 79 (gold) the O_{IV} and O_V levels are gradually filled. Consequently one might expect a steady increase in the relative intensity of $L\gamma_6$ as a function of atomic number for $72<Z<80$.

Measurements of the intensity of $L\gamma_6$ relative to the intensity of $L\gamma_1$ in this atomic-number region have been made. They are recorded in Table I. These measurements were made by using a two-crystal x-ray spectrometer with an ionization chamber. $L\gamma_1$ was selected as a reference line because (a) it is near $L\gamma_6$ in wavelength, (b) it has the same initial state (L_{II}), and (c) its intensity relative to other prominent L-series lines is constant in this range of atomic numbers.

It is clear from the data in Table I that the relative intensity of $L\gamma_6$ increases rapidly and essentially linearly with atomic number while the O_{IV} levels are being filled.

TABLE I

Intensity of $L\gamma_6$ relative to $L\gamma_1$ as 100

Element	Intensity	Element	Intensity
Ta(73)	2.0	Ir(77)	7.3
W (74)	2.8		
Rh(75)	4.7	Au(79)	11.3
Os(76)	6.2	Te(81)	12.3