

STUDY OF ANOMALIES IN  $K_{\beta}/K_{\alpha}$  RATIOS  
OBSERVED FOLLOWING K-ELECTRON CAPTURE

G. Paić and V. Pečar

Institute "Ruđer Bošković", Zagreb, Yugoslavia

$K_{\beta}/K_{\alpha}$  measurements for Ti, V, Cr, Fe, Cu, and Zn have been performed for cases of K vacancies created by K-electron capture and x-ray excitation. For nuclei with  $Z < 28$ , a marked difference in the  $K_{\beta}/K_{\alpha}$  ratios obtained by two modes has been found.

Four elements  $^{48,49}\text{V}$ ,  $^{51}\text{Cr}$ ,  $^{54}\text{Mn}$ , and  $^{57}\text{Co}$  were studied in the same range where Hansen et al.<sup>1)</sup> reported discrepancies with bremsstrahlung or electron bombardment data.<sup>2)</sup> For completeness, the results obtained for two additional elements,  $^{65}\text{Zn}$  and  $^{67}\text{Ga}$ , are included. All sources (except  $^{54}\text{Mn}$ ) and targets were prepared from solutions which were allowed to dry up on thin plastic or metallic foils. The  $^{54}\text{Mn}$  source was an IAEA calibration source.

X-ray spectra were measured using a Si(Li) detector of an area of  $12\text{mm}^2$  with a Be window  $25\mu\text{m}$  thick. The resolution of the system was 180 eV at 6.4 keV.

The results obtained for the  $K_{\beta}/K_{\alpha}$  ratios are shown in Table I. The averaged and weighted data of Salem et al.<sup>2)</sup> are shown for comparison.

Table I

Element	Compiled value Salem et al. <sup>2)</sup>	Present work: x-ray excitation	Present work: K-capture excitation
Ti	0.134	$0.133 \pm 0.002$	$0.125 \pm 0.002$
V	0.1345	$0.134 \pm 0.002$	$0.121 \pm 0.002$
Cr	0.135	$0.134 \pm 0.002$	$0.127 \pm 0.002$
Fe	0.135	$0.135 \pm 0.002$	$0.129 \pm 0.002$
Cu	0.1365	$0.136 \pm 0.002$	$0.137 \pm 0.002$
Zn	0.138	$0.137 \pm 0.002$	$0.136 \pm 0.002$

References

1. Hansen et al., Nucl. Phys. A142 (1970) 604
2. S.I. Salem et al., At.Data Nucl. Tables 14 (1974) 92