

SEARCHING FOR THE LIFETIME BROADENING OF THE RUBIDIUM *KLL* AUGER LINES

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It is known that if the peripheral electron configuration of an atom is changed (by multiple ionization or by chemical bonding), atomic level energies changed and Coster-Kronig decay channels may either open or close. This results also in changing of the *KLL* Auger line widths. Thus, e.g., in the case of 3*d* transition metal series the *KL₂L₃* Auger lines are broader in the metal than in free atoms due to this lifetime effect. Having to our disposal two ⁸⁵Sr (*T*_{1/2}=64.9 d) sources prepared by vacuum evaporation on a C backing and by implantation of 30 keV ⁸⁵Sr ions into a Pt matrix we decided to search for the about effect also in the case of ⁸⁵Rb situated in quite different matrices. The *KLL* Auger spectra were measured with a combined electrostatic electron spectrometer [2]. Obtained natural widths (in eV) for individual *KLL* Auger lines are presented in the table together with the estimated values. As can be seen, the values measured for the

Auger line	⁸⁵ Sr source			Estimated
	Evaporated	Implanted	W.M. ^{a)}	W.M. ^{b)}
<i>KL₁L₁</i>	9.3(1.3)	8.2(1.0)	8.6(8)	10.9(3)
<i>KL₁L₂</i>	7.8(9)	8.1(6)	8.0(5)	8.3(3)
<i>KL₁L₃</i>	8.1(1.9)	7.3(8)	7.4(8)	8.2(3)
<i>KL₂L₂</i>	5.5(2.0)	5.3(1.3)	5.4(1.1)	5.7(2)
<i>KL₂L₃</i>	4.8(2)	5.1(2)	5.0(1)	5.6(2)
<i>KL₃L₃</i>	4.6(4)	5.6(4)	5.1(3)	5.5(2)

^{a)} W.M. means "weighted mean".

^{b)} Values obtained from weighted means of natural level widths [2,3,4].

evaporated and implanted sources agree with each other within one standard deviation with the exception of the *KL₃L₃* line. Nevertheless some indication of broadening can be identified for the well resolved *KL₁L₂*, *KL₂L₃*, and *KL₃L₃* lines. Evidently much higher spectrum statistics is required for searching for the lifetime effect. Estimated natural widths values do not fit well the weighted means of the measured ones for the *KL₁L₁* and *KL₂L₃* lines.

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