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Further tests of internal-conversion theory with precise γ- and x-ray spectroscopy. N. NICA, W.E. ROCKWELL, J.C. HARDY, V.E. IACOB, H.I. PARK, J. GOODWIN, Texas A&M University, M.B. TRZHASKOVSKAYA, Petersburg Nuclear Physics Institute — Recently we reported [1] a measurement of the K-shell internal conversion coefficient (ICC) of the 80.2-keV $M4$ transition in $^{193}\mathrm{Ir}^{m}$. Our result, α_K=103.0(8), agreed well with the value 103.5(1) calculated with the K-shell hole accounted for in the "frozen orbital" approximation, and disagreed strongly with the value 92.2(1) calculated when the hole is ignored, a common approach taken in the past. Of the 100 transitions listed and compared with theory in the review by Raman *et al.* [2], this is the most sensitive to the treatment of the hole. However, there are some other cases listed where experiment disagrees significantly with both types of calculation, making it difficult for one to wholeheartedly endorse the "frozen orbital" calculation. As a further step in settling this issue, we report here a measurement of the ratio of α_K values for the 127.5-keV $E3$ transition in $^{134}\mathrm{Cs}^{m}$ and the 662-keV $M4$ transition in ^{137}Ba. Our preliminary result, $\alpha_K(\mathrm{Cs})/\alpha_K(\mathrm{Ba})$=30.4(3), should be compared with the experimental ratio quoted in [2], 28.8(5), and with calculated ratios, 30.0 (hole) and 29.5 (no hole). The disagreement between experiment and theory is now removed and, furthermore, our result again points to the calculation that includes the hole. [1] N. Nica et al., Phys. Rev. C 70 (2004) 054305, [2] S. Raman et al., Phys. Rev. C 66 (2003) 044312.

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