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Correlated Two-Electron Capture by Ion with Emission of Photon A.I. MIKHAILOV, Russian Nuclear Physics Institute, I.A. MIKHAILOV, A.V. NEFIODOV, G. PLUNIEN, G. SOFF — The correlated double electron capture into the K shell of bare ions with emission of a single photon is considered. The process is treated as a time-reversed atomic double photoionization. For ten years of experimental investigations there is no evidence of existence of the reaction. There is a theoretical prediction (Phys. Rev. A 55 (1997) 1952), that a probability of the process grows rapidly with the ion charge due to relativistic effects and that the cross section does not depend on target atoms. However the recent experiment (GSI Scien.Rep., ISSN 174 (2001) 98) failed to observe this process under the recommended conditions. The present work reveals an incorrectness of those theoretical predictions and provides an expression to determine optimal experimental conditions for observing the process. We suggest to use ion beams slower than those in the experiment (NIM B98 (1995)303), and do not recommend to use heavy ions. We show that the cross section can increase significantly for solid-state targets and decelerated ion beams. The novel technique of deceleration of multicharged ions planned at GSI can be applied to perform such experiments.

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