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Determination of environmental dependence of the β^- decay half-life of ^{198}Au[1] A. DIBIDAD, REU student from Florida A&M University, J. GOODWIN, J. HARDY, Cyclotron Institute, Texas A&M University — A series of articles by the C. Rolfs group [1] claimed changes in the half-lives of isotopes undergoing α, β^-, β^+, and electron-capture decays as the temperature reduced to 12 K from room temperature. These isotopes were contained in metallic, conductive environments, such as Au, Cu, and Pd, but it was also suggested that the half-life is different in an insulator. One publication [1] reported the half-life of ^{198}Au in a gold metal environment to change by 3.6 $\pm$1.0% between room temperature and 12 K. Until then, radioactive half-lives were considered independent of environmental factors. We repeated the measurements of the ^{198}Au half-life in a gold metal environment under similar conditions as ref. [1] and demonstrated [2] that the half-life is the same at both temperatures within 0.04%, two orders of magnitude below the original claims. In the experiment reported here, we measured the half-life of ^{198}Au in an insulated environment – gold (III) oxide – at room temperature. Preliminary results indicate there is no difference in the measured half-life in an insulator as compared in a conductor.

[1] T. Spillane *et al*, Eur. Phys. J. A 31, 203 (2007)
[2] J.R. Goodwin *et al*, Eur. Phys. J. A 34, 271 (2007)

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