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Efficient conversion of ^{3}He(n,tp) and ^{10}B(n,α^7Li) reaction energies into far-ultraviolet radiation by noble gas excimers PATRICK P. HUGHES, MICHAEL A. COPLAN, University of Maryland, ALAN K. THOMPSON, ROBERT E. VEST, National Institute of Standards and Technology, CHARLES W. CLARK, Joint Quantum Institute, National Institute of Standards and Technology and University of Maryland — Previous work[1,2]showed that the ^{3}He(n,tp) reaction in a cell of ^{3}He at atmospheric pressure generated tens of far-ultraviolet (FUV) photons per reacted neutron. Here we report amplification of that signal by factors of 1000 when noble gases are added to the cell. Calibrated filter-detector measurements show that this large signal is due to noble-gas excimer emissions, and that the nuclear reaction energy is converted to FUV radiation with efficiencies of up to 30%. Our results have been placed on an absolute scale through calibrations at the NIST SURF III Synchrotron and Center for Neutron Research.[3] We have also seen large neutron-induced FUV signals when the ^{3}He gas in our system is replaced with a ^{10}B film target; an experiment on substituting ^{3}He with BF_3 is underway. Our results suggest possibilities for high-efficiency, non-^{3}He neutron detectors as an alternative to existing proportional counters. [1]A. K. Thompson, *et al., J. Res. Natl. Inst. Stand. Technol.* **113**, 69 (2008) [2]M. A. Coplan, A. K. Thompson and C. W. Clark, U.S. Patent No. 7,791,045 (2010) [3]P.P. Hughes, *et al.,* arXiv:1009.4707 (*Appl. Phys. Lett.* in press, 2010)

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