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Light-induced degradation in gallium-doped silicon JEANETTE LINDROOS[1], MARKO YLI-KOSKI, ANTTI HAARAHILTUNEN, Aalto University, Department of Micro and Nanosciences, MARTIN C. SCHUBERT[2], Fraunhofer Institute for Solar Energy Systems (ISE), HELE SAVIN, Aalto University, Department of Micro and Nanosciences — Light-induced degradation (LID) is a lifetime-decreasing effect in silicon solar cells attributed to the formation of B-O defect complexes during illumination [1-2]. However, Savin et al. [3] have recently observed degradation similar to LID in B- and P-doped Si contaminated with Cu, suggesting that Cu might be the cause of LID. Since Ga-doped Si is considered a degradation-free option to conventional B-doped Si [2], lifetime stability should also be studied in Cu-contaminated Ga-Si. Hence, in this paper, we intentionally contaminated high-oxygen 0.41 and 10.1 Ωcm Ga-doped Cz-Si with Cu and subjected the material to illumination. No lifetime degradation was measured with μ-PCD in clean Ga-Si or at low Cu levels, which is in agreement with the previously reported LID-free behavior of Ga-Si [2]. However, at higher Cu levels (20 ppb), a clear lifetime degradation was observed in Ga-Si. This lifetime degradation increased with increasing Cu concentration or with increasing wafer resistivity. [1] J. Schmidt, A.G. Aberle and R. Hezel, 26th IEEE PVSC, Anaheim, CA, USA, p.13-18 (1997). [2] S.W. Glunz, S. Rein, W. Warta, J. Knobloch and W. Wettling. Sol. Energ. Mat. Sol. C. 65, 219-229 (2001). [3] H. Savin, M. Yli-Koski and A. Haarahiltunen. Appl. Phys. Lett. 95, 152111 (2009).

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