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A comparison between defects created by light soaking and tritium decay in amorphous silicon TONG JU, University of Utah, STEFAN ZUKOTYNSKI, NAZIR KHERANI, University of Toronto, P. CRAIG TAYLOR, Colorado School of Mines, PAUL STRADINS, National Renewable Energy Laboratory, UNIVERSITY OF TORONTO COLLABORATION, NATIONAL RENEWABLE ENERGY LABORATORY COLLABORATION — We compare two ways to create defects in a-Si:H, namely decay of bonded tritium and irradiation with visible light. Tritium decays to He^3, emitting a beta particle and an antineutrino. In tritium doped a-Si:H samples each beta decay of tritium bonded to silicon will create a defect by converting a bonded tritium to an interstitial helium, leaving behind a silicon dangling bond. We track these defects using electron spin resonance (ESR). We have kept the sample in liquid nitrogen for two years. After two years the defect density increases without saturation to a value of $7x10^{19}/cm^3$. In the second experiment, we have kept the sample in liquid nitrogen irradiated with white light of intensity about $100mW/cm^2$. After about 6 months, the spin density increased to about $9x10^{17}/cm^3$ with no evidence of saturation. In the tritiated sample the increase in the defect density is proportional to the time, t, while in the light-soaked sample the increase is approximately proportional to $t^{1/3}$. This difference in behavior will be discussed.

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