

STRUCTURAL INSTABILITY OF ANNEALED a-Si/a-Ge NANOSTRUCTURES

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It is shown that heat treatments cause remarkable structural instability in nanostructures made of alternating 3 nm thick hydrogenated layers of a-Si and a-Ge deposited by sputtering. Upon annealing surface bumps form whose size and density increase with increasing H content. They are due to the presence of H bubbles inside the samples, which even blow up for the highest H content. The H bubbles form by accumulation of H₂ molecules made possible by the break of the Si-H and Ge-H bonds driven by the energy supplied by the heat treatment and by the recombination of thermally generated carriers.