INFLUENCE OF LIGHT ON WATER DECOMPOSITION AT Al- AND Ti-DOPED SILICON ELECTRODES

V.E. Primachenko, Yu.M. Pedchenko, D.V. Gamov, G.V. Kalistiy, V.V. Fedulov, V.A. Chernobay

Institute of Semiconductor Physics,
Nat. Acad. Sci. of Ukraine
(*45, Nauka Ave., Kyiv 03680, Ukraine;*
e-mail: pve18@isp.kiev.ua)

S u m m a r y

Al (E = 75 keV, $D = 1.15 \times 10^{16}$ cm^{-2}) and Ti (E = 125 keV, $D = 7.6 \times 10^{15}$ cm^{-2}) ions were implanted into thermally oxidized n-Si specimens ($\rho = 4\ \Omega \times$ cm). The specimens obtained were used as electrodes to study the decomposition of distilled water with Pt or Yb serving as counterelectrodes. The influence of illumination of Si⟨Al⟩ and Si⟨Ti⟩ electrodes on the current generation accompanied by water decomposition in the absence of an external electric voltage ($V = 0$) between the silicon electrode and the counterelectrode and in the case where an external positive voltage ($V = +9.7$ V) is applied to silicon electrodes has been studied for the first time. A conclusion has been made that the role of illumination in enhancing the rate of water decomposition is reduced to the enrichment of the near-surface region of the silicon electrode by electrons.