

Title: Ageing effects on the wettability behavior of laser textured silicon

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Abstract: In the present work we investigate the ageing of acid cleaned femtosecond laser textured < 100 > silicon surfaces. Changes in the surface structure and chemistry were analysed by Rutherford backscattering spectrometry (RBS) and X-ray photoelectron spectroscopy (XPS), in order to explain the variation with time of the water contact angles of the laser textured surfaces. It is shown that highly hydrophobic silicon surfaces are obtained immediately after laser texturing and cleaning with acid solutions (water contact angle >120 degrees). However these surfaces are not stable and ageing leads to a decrease of the water contact angle which reaches a value of 80 degrees. XPS analysis of the surfaces shows that the growth of the native oxide layer is most probably responsible for this behavior. (C) 2010 Elsevier B.V. All rights reserved.

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