Abstract Submitted
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**Modification of the wettability of $TiO_2$ surfaces with ion bombardment.** OSCAR RODRIGUEZ DE LA FUENTE, BEATRIZ MARTINEZ, JUAN ROJO, Departamento de Fisica de Materiales, Universidad Complutense de Madrid — Tailoring the affinity of a surface towards water adsorption is crucial for a number of physicochemical processes. Many applications depend on its proper control, such as those related to cell adhesion, some catalytic phenomena or the development of hydrophobic textiles. $TiO_2$ is a most interesting material, especially for its enhanced hydrophilicity when illuminated with light. In this work, we have modified rutile $TiO_2(110)$ surfaces with ion bombardment and studied their composition, structure and interaction with water with contact angle measurements (static and dynamic), optical microscopy, AFM, Auger electron spectroscopy, LEED and IRAS. We show how the density of water nucleation centers and the shape of the microdroplets, when the surface is exposed to water vapor, depend on the morphological and chemical state of the surface. In general, we observe that the affinity for water is larger for the flat, non-bombarded surfaces. Indeed, and contrary to most observations reported in the literature, the contact angle of both microscopic and macroscopic droplets is higher for the defective surfaces. We attribute such behavior to the special structure of the first adsorbed molecular water layers, which is strongly influenced by surface defects and the hydrogen bond network.

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