Symp D8

Preparation of Hydroxyl-Terminated Si(001) Substrates
수산화 기로 표면을 마무리한 Si(001) 기질의 준비

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Preparation of hydroxyl (OH) groups on Si surfaces is considered very important in the area of atomic layer deposition (ALD) because the H-terminated Si wafers that are typically used as substrates show the incubation period in the ALD of various oxide materials. It is also important in surface science where chemisorption of molecules on and functionalization of Si surfaces are among major issues.

Hydroxylation of Si(001) surfaces have been carried out by two different routes, one from a clean Si(001)2x1 surface and the other from a H-terminated Si(001) surface, in which both surfaces were treated with chlorine followed by exposure to water at an elevated temperature.

The hydroxylation processes of Si(001) surfaces were investigated by x-ray photoelectron spectroscopy, ultraviolet photoelectron spectroscopy, and synchrotron radiation photoemission spectroscopy. These surfaces were employed in the atomic layer deposition (ALD) of Al_2O_3 thin films and shown to have the effect of drastically reducing the incubation period compared to the hydrogen-terminated Si(001) surface.