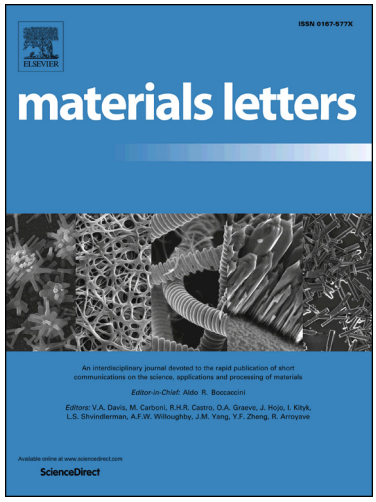

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Heat induced superhydrophilic glass surface

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Abstract: Silica and its derivative as a major component of earth mantel have long been believed to have profound effects on the evolution of nature and life. In this article, the wetting behaviors of silica and its derivatives after heat treatment are investigated. We obtain a superhydrophilic surface on soda-lime glass by heat treatment, but not on fused quartz and single crystal silica. The annealed soda-lime glass exhibits excellent anti-fog effect and can maintain at hydrophilic state in the air for one month. The glass is also highly transparent throughout the visible light region and exhibits excellent ultraviolet resistance and mechanical stability. The wettability transition is attributed to increased surface roughness and heat-induced composition variation. This investigation may shed light on the design and fabrication of novel glass products.

Keywords: Soda-lime glass; Interface wetting; Atomic force microscopy; XPS; Electron probe microanalysis

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