

3-D Microfabrication Process by Double Exposure Method in Standard X-ray Lithography

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Abstract

This paper reports a novel three dimensional (3-D) microfabrication process by double X-ray exposure method (D²XL: Double exposure Deep X-ray Lithography) in standard deep X-ray lithography. The proposed microfabrication process made it possible to realize 3-D microstructures with an inclined and curved sidewall without any special apparatuses and difficult process control. In order to demonstrate the feasibility of D²XL, the 3-D microfabrication of micro-needle array was carried out. The sharp micro-needle array with the top radius of less than 100 nm was easily and successfully fabricated by this technique.

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