

## Research of Inorganic Extreme Ultraviolet Photoresists Based on Silver Ethyl Xanthate

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Extreme ultraviolet (EUV) lithography has been considered as the next-generation lithography technology and has been investigated. Development of photoresists is one of the most important components for realization of EUV lithography technology. The organic-based photoresists have been used in deep ultraviolet (DUV) lithography for a long time. However, the organic-based photoresists have challenges in balancing among key factors such as the high resolution, small line edge roughness, high sensitivity, and thickness. To achieve high resolution and sensitivity without pattern collapse, inorganic photoresists such as metal-based photoresists are proposed. Metal-based photoresists have 2~3 times higher EUV absorbance and 25~40 times better etch resistance than organic-based photoresists, which makes it possible to fabricate thin films below 50 nm. In this study, we demonstrate the feasibility of silver ethyl xanthate as a photoresist for the EUV and electron beam lithography. Developed photoresist presents the outstanding high sensitivity to electron beam and EUV and this photoresist will provide a great opportunity for next generation semiconductor requiring sub-nano fine pattern.