



1. Title:	Chemically-Amplified Negative-Tone Molecular Resist using Polarity Change Reaction for EUVL
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3. Abstract body:

LER is one of the most critical issue in scaling MOS LSIs. In order to reduce LER, we have investigated molecular resists using low molecular weight compound with small dispersity because larger molecular weight and larger molecular-weight distribution of polymer resist are major origins of LER. Thus far we showed that a chemically-amplified(CA) positive-tone molecular resist using a partially-protected polyphenol was effective to reduce LER[1]. In this paper, we report that application of this concept to negative-tone CA resist for EUV lithography and demonstration of EUV lithographic result.

The CA negative-tone molecular resist has realized by introducing polarity-change reaction. A polyphenol with a polar gamma-hydroxycarboxyl group of a precursor of non-polar lactone group is used as a base material. Using a resist composed of the base material and PAG, 40 nm L&S pattern with an aspect ratio of 3 at a dose of 76uJ/cm² was fabricated by EB lithography[2]. After further investigation, the resist successfully resolved 30nm L&S at 45mJ/cm² using a small-field EUV exposure tool (HiNA) at ASET. This work was supported by NEDO.

[1] H. Hirayama, et. al., Jpn. J. App. Phys., 44, 7B (2005) 5484.

[2] K. Kojima, et al., Proc. SPIE 6153 (2006) 164.