Study of Alternate Hardmasks for EUV Patterning

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Traditional patterning stacks for DUV/193nm patterning have been based on a tri-layer scheme with an organic planarizing layer, Silicon ARC (anti-reflective coating) or organic BARC (bottom anti reflective coating) and photoresist. At EUV wavelength, there is no longer a need for reflectivity control, so it offers an opportunity to look at different types of underlayers for patterning at sub-36nm pitch length scales. The hardmask layer under the resist can be designed to optimize secondary electron generation at the resist/hardmask interface to improve patterning performance, as well as potentially simplify the patterning scheme. This work explores EUV patterning on deposited hardmasks of various types such as silicon oxides and metal hardmasks.

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