Novel EUV Resist Development for Sub-7 nm Node

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Extreme ultraviolet (EUV) lithography has been recognized as a promising candidate for the manufacturing of semiconductor devices as LS and CH pattern for 7nm node and beyond. EUV lithography is ready for high volume manufacturing stage. For the high volume manufacturing of semiconductor devices, significant improvement of sensitivity and line edge roughness (LWR) is required for EUV resist. It is well-known that the key challenge for EUV resist is the simultaneous requirement of ultrahigh resolution (R), low line edge roughness (L) and high sensitivity (S). Especially high sensitivity and good roughness is important for EUV lithography high volume manufacturing. We are trying to improve sensitivity and LWR from many directions. From material side, we found that both sensitivity and LWR are simultaneously improved by controlling acid diffusion length and efficiency of acid generation using novel resin and PAG. In this paper, we will report the recent progress of sensitivity and LWR/LCDU improvement of JSR novel EUV resist.

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