

酸増殖剤を含む黒色化学増幅レジストの感光特性

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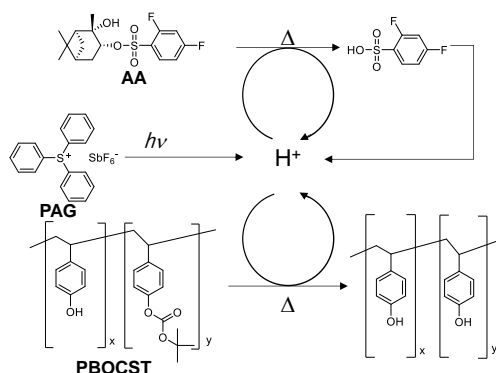
Photosensitivity characteristic of black chemically amplified resists containing acid amplifiers
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Black photoresists are low photosensitivity because light dose not penetrate deep into the film. To improve the photosensitivity, we used acid amplifiers (AA) that are autocatalytically decomposed by heating in the presence of a small amount of photogenerated acids. In this work, we report photosensitivity characteristics of black chemically amplified resists enhanced by AA. Photosensitivity curves show that minimum exposure doses were 200 mJ/cm² in the absence of AA and 20 mJ/cm² in the presence of 10 wt% of AA (vs. PBOCST), and the photosensitivity was enhanced 10 times in the presence of AA (Fig. 1).

Keywords : acid amplifier; chemically amplified resist; black resist

黒色レジストは樹脂が光を吸収してしまうため感度が低いという問題がある。そこで、本研究では光酸発生剤から発生した少量の酸存在下で加熱を行うことにより自己触媒的に分解し、酸を放出する酸増殖剤(AA)を用いることで感度の向上を図った。

本系では PBOCST、光酸発生剤(PAG)、カーボンブラックからなる黒色の化学増幅レジストに酸増殖剤を組み込むことで感度の向上を目指した(Scheme 1)。感度曲線より、酸増殖剤を含まない系は最小露光量 200 mJ/cm²、含む系では最小露光量 20 mJ/cm²であり、酸増殖剤の添加により感度が 10 倍も向上した(Fig. 1)。



Scheme 1 chemically amplified resists containing acid amplifiers.

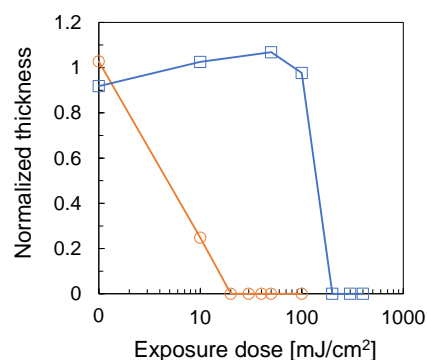


Fig. 1 Photosensitivity curves of black chemically amplified resists in the absence of (□) and in the presence of (○)10 wt% of AA (vs. PBOCST).