

Abstract Submitted
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Calix[6]arene electron beam sensitivity and contrast dependence on functionalization and molecular weight¹ GREGORY SPENCER, DANIEL RALLS, STEPHAN WOLFE, MICHAEL BLANDA, ANUP BANDYOPADHYAY, Texas State University-San Marcos — Calixarenes are macrocyclic molecules that have shown high resolution as electron beam resists. Earlier work has demonstrated that the sensitivity can be increased by adding functional groups to the molecular rim of these ring-shaped molecules. However, these earlier studies used either unfunctionalized resists or ones that were fully functionalized. In this study, the number of functional groups added to a calix[6]arene structure was deliberately varied from zero to the maximum possible number of groups. This allowed direct observation of the effect of the number of attached groups on the sensitivity. Two different conformers were used; a cone conformer and the 1,2,3-alternate conformer. Both used xylylenyl groups as bridging units, giving conformationally-locked monomers. The number of added allyl groups was varied from 0 to 8. The resulting nine resists were exposed and contrast curves were measured by AFM. This allowed measurement of both resist sensitivity and contrast. The sensitivity was found to be a strong function of the number of pendant groups. Also the effect of molecular weight on sensitivity was found for the heaviest resist, after the functional group effect saturated between four and six groups. These results and comparison with others will be discussed.

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Gregory Spencer
Texas State University-San Marcos

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