1. Title:	Thermodynamic Analysis of Acid Amplifiers for EUV Lithography
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3. Abstract body:

Extreme Ultraviolet (EUV, 13.4 nm) imaging technology continues to be the primary option for the 32 and 22 nm microelectronics nodes. However, EUV photoresists have struggled to meet their performance targets for resolution, Line Width Roughness (LWR) and sensitivity. During last year's EUVL Symposium, EUV resist performance in these three areas was named as the number one barrier to EUV technology implementation. Our 2004 SPIE paper, and other work show why these three performance criteria are in opposition to each other. In brief, the critical component for these chemically amplified resists is the photo-generated acid. We predicted that the best way to get sensitivity, resolution, and LWR all in the same resist was by creating more acid molecules per photon (essentially increase the quantum yield of the resist system). One way to increase the quantum yield of the resist is through the use of acid amplifiers (AAs). Acid amplifiers are compounds that decompose in the presence of catalytic levels of acid to generate more acid, thereby, effectively increasing the quantum yield.

Unfortunately, however, all existing AAs are not appropriate for use in EUV photoresists. They create weak acids, outgas, or are unstable. In this poster we will demonstrate a new way to evaluate the reactivity of acid amplifiers by determining the relative thermodynamics of productive and non-productive reaction pathways. We use Chem3D to calculate the heat of formation of reactants, intermediates and products and compare thermal decomposition vs. acid catalyzed reaction pathways.