X-ray microscopy investigations of photoresists and molecular semiconductors

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X-ray microscopy is a very useful tool to get structural and chemical information on a length scale of ~30 nm. This technique is used to study the undeveloped patterns (latent patterns) in the photoresist hydrogen silsesquioxane (HSQ) to separate effects occurring during writing in the resist and development of the photoresist. A dose and thickness dependent spatial spread of the cross-linking reaction / polymer network formation beyond the exposure boundaries is observed and quantified in detail. X-ray microscopy is also a useful tool to study molecular semiconductors. In particular the NEXAFS dichroism of organic molecular crystals makes it possible to study both the molecular orientation and topography of samples in polarization dependent x-ray microscopy.