HIGH RESOLUTION PATTERN REPLICATION UTILIZING SILOXANE-MODIFIED ACRYLATE NETWORK STAMPS

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Introduction
Contact lithography techniques, such as nanoimprint lithography and step-and-flash lithography, show great promise in the ability to transfer nanoscale patterns in an efficient, economic fashion. One of the drawbacks of these contact techniques is the lack of availability of suitable, inexpensive, high resolution stamp from which the initial image is pressed. We report the use of siloxane-modified acrylate networks as stamps for contact nanolithography. We have found the networks composed of a mixture of photopolymerizable acrylates can be cast against hard masters, photochemically cured, then in turn, be used repeatedly as stamps in the replication of nanometer sized features into an appropriate imaging layer. The low surface energy siloxane constituent imparts good contact and release character to the stamp. The siloxane-modified stamps were used to transfer pattern smaller than 100nm into a photopolymer layer.

Acknowledgements.

References