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Micro and Nano Replication Using Hot Embossing and Applications

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Nanoimprint lithography (NIL) has demonstrated high resolution of 5 nm and molecular scale pattern replication [1-2]. There are two schemes of NIL, namely UV-curable NIL and thermal NIL. The former has advantages of absence of thermal expansion that would result in difficulty for precise alignment, low imprint pressure and low viscosity of the un-cured resist that enables large feature imprint. However, at present the later is more widely employed for nano and micro patterning, largely because it is a more straightforward process and works with a broader range of polymer materials.

After presenting the general aspect of the hot-embossing NIL, this talk will present an overview of the IMI activities in micro- and nano- replication using thermal NIL and its applications in biomedical field. More specifically, we are going to report the successful replication of 100 nm to millimeter-scale features by thermal NIL, and the use of thermal NIL for creating SERS active substrates with customized geometry and chemical functions.

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