Nanolithography

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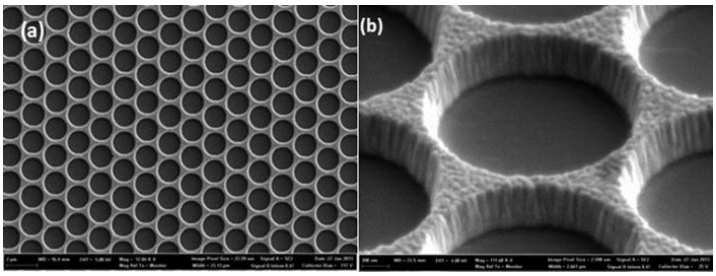
Nanolithography is the collection of techniques concerned the fabrication of nanometer-scale structures, with at least one dimension less than 100nm [1, 2]. These techniques are separated into two categories: those that etch away the molecules leaving behind the desired structure and those that write the desired structure on the surface, when being exposed to Light, Electrons or Ions, X-Rays [1, 3]. More of them use a resist, a thin layer of polymer sensitive to light, which is categorized into positive or negative one. Depending on what part of it is being exposed, they leave behind selected areas of the underlying semiconductor substrate [3, 4].The lithographic techniques being discussed through this work are assorted by the different kind of energy used each time. *Optical Lithography/Photolithography* uses low wavelength light to modify the light-sensitive resist. On top of the resist, a photomask, having the desirable pattern, is being overlaid [1, 3, 4]. *Electron-Beam Lithography* is a beam of electrons scanning the surface of the electro-sensitive resist, giving the desirable shape. *Focused Ion Beam Lithography* is a similar technique with an accelerated focused ion beam used instead of the electron one [1, 2, 3].During the *X-Ray Lithography*, X-Rays are used to selectively remove parts of the exposed resist transferring a geometric pattern [1, 3]. *Nano-imprint Lithography* uses a mold that contains the nanoscale design is set in order to imprint it on the resist [1, 3].
Nanolithography has several applications in many fields, more specifically in Electronics and Microsystems, in Biotechnologies and Nanomedicine, in Optics and Photonics, in Environment and Energy Monitoring [3].



(a) Top view of pattern on a GaSb TPV diode. (b) Image of PhC pattern taken at 45° relative to the surface normal [5].

REFERENCES

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