**Fabrication of microchannels in polyethersulfone (PES) substrate with Nd:YAG laser**

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Polymers have many important applications in industry because of their low cost and high quality. Microchannels fabricated in polymers are used in biology and microfluidic devices. Different methods are used for fabrication of microfluidic channels in polymers like hot-embossing, injection molding, photolithography, wet and dry etching, laser ablation and femtosecond laser direct writing. Among the possible fabrication methods, laser processing has been proved to be the most efficient and clean process. However, in spite of the better surface quality in femtosecond laser material processing, pulsed nanosecond lasers are more cost effective and robust.

We present laser fabrication of microchannels in PES substrate with a pulsed nanosecond Q-switch Nd:YAG laser. Polyethersulfone (PES) is an excellent engineering plastic because of its high thermal stability. It is a useful polymer used in a wide range of applications from microelectronics to biology. The fabrication includes laser ablation followed by chemical treatment for reducing damage to the surface and improving the surface quality. The laser operates at the pulse repetition rates of 5-15 Hz and sample is moved during fabrication with scanning velocities of 1-8 µm/s. The optimum conditions for fabrication of microchannels are found.