J Laser Opt Photonics 2016, 3:2 (Suppl)
http://dx.doi.org/10.4172/2469-410X.C1.006

Laser interaction with polyethersuflone film and membrane: Improving the surface for the biological applications

Hedieh Pazokian
Laser and Optics Research School, Iran

Laser interaction with materials is an ongoing and developing field of Photonics and applied physics. Polymeric materials have very important applications in biology and medical science. For this purpose, the surface of the material in contact with the blood and the biological cells have to be blood and bio compatible. The surface modification of the polymeric materials, then, is intersted for the biological applications. Among the various methods for the surface modification, laser interaction has very advantages respect to the others. With proper selection of the laser parameters, the optimum improvement is obtained. Here laser surface modification of polymeric material relying on polyethersulfone (PES) membrane and film is discussed. The effects of the most important laser parameters including the laser wavelength, the fluence, the number of pulses, the pulse repetition rate and the pulse duration is investigated and the optimized condition is found. Beside the surface modification for the biological applcations, the other results of the interaction like the effects of the presence of pedestal pulse in ultrashort pulses, the possibility for the investigation of the bulk of the membrane with laser treatment and the modification of the surface for the other applications are talked. (PES is the most important applied polymeric material for the hemodialysis filters.)

h_pazokian2005@yahoo.com

Analysis of amplified spontaneous emission intensity: A generalized formula

G Ghani Moghadam
[1]Amirkabir University of Technology, Iran
[2]Nuclear Science &Technology Research Institute, Iran

The very high gain laser active media that are used for mirrorless lasers such as soft X-ray lasers have quite high gain and amplified spontaneous emission is the base of mechanism. Therefore, the calculation of ASE intensity is very important and is possible by the numerical solution of the radiation transport equation for the active medium. In low intensities, the Linford approximation has been used that is not valid in high intensities. In this paper, we have used the numerical solution of the rate equation and the Linford equation and by fitting data offered a general formula for both low and high intensities to calculate the ASE intensity. This formula present the ASE intensity for different solid angles and for both homogeneously and inhomogeneously broadened line. The results compared with the corrected Linford formula in low intensities andasymptotic limiting formula for the high gain saturation. Therefore, a general formula is proposed for calculating the intensity of amplified spontaneous emission (ASE) both in low, medium and high intensity regimes for both homogeneous and inhomogeneous line broadening. An error analysis over the entire region of the gain length product is also given.It is seen that the error of this formula respect to numerical solutionis accurate enough for practical purposes.

ghanimoghadam@yahoo.com