Composite material with the carbon nanostructures for the applications in optical power limiting

Belousova I.M.[1,2], Kislyakov I.M.[1,2], Videnichev D.A.*[1,2], Ryzhov A.A.[1,2], Volynkin V.M.[3]

[1]*SIC Vavilov State Optical Institute, St. Petersburg, 199034, Russia*
[2]*St. Petersburg State University of ITMO, St. Petersburg, 197101, Russia*
[3]*FSUE NITIOM A-RSC "Vavilov GOI", St.Petersburg, Russia*
**e-mail: vid-dmitry@yandex.ru*

It is well known that suspensions of the different carbon nanoparticles such as carbon black [1], nanotubes [2], multi-shell fullerene-like particles [3] and other show the abilities for the optical power limiting. The phenomenon in such suspensions derives from the light-induced scattering. However, bleaching of the suspension under the radiation of the laser pulse constrains their use as an effective limiter in the rate repetition mode of the laser radiation [4]. We experimentally showed the possibility of the composing of the carbon nanotubes suspension on the organic polymer base which limits the laser impulses coming in with the rate up to 10 Hz. This composite material with carbon nanotubes possesses good optical quality, is transparent in optical spectrum (about 70%) and does not have any coloration. Moreover it showed long-term stability and can act in the wide range of the temperature. So the limiter with this composite material can be used in the observation devices for the protection of the eyes and detectors.

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