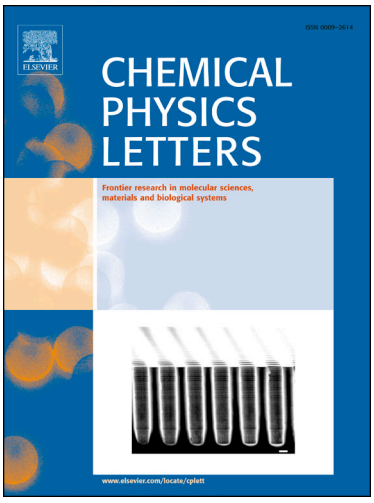

Research paper

Influence of dopants on supercontinuum generation during the femtosecond laser filamentation in water

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Influence of dopants on supercontinuum generation during the femtosecond laser filamentation in water

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Our experiments show that lactose as one of organic substance and nitric acid as one of inorganic substance added into distilled water can influence the supercontinuum generation in aqueous solution irradiated by the ultrashort femtosecond laser pulses. It is found that once the dopants are added into the water, the supercontinuum generation is suppressed to different extent, and the supercontinuum suppression is enhanced by increasing the concentrations of lactose solution and nitric acid solution. Through the analysis, we find that the capture of electrons by the solvent, and spectral absorption or scattering by the solution may also result in the supercontinuum suppression. These studies will be helpful to understanding of the supercontinuum generation during femtosecond filamentation in liquid samples.

Keywords: asymmetric broadening, supercontinuum suppression, absorption spectra

1. Introduction

Laser filamentation is well known to be a dynamically balanced process between the self-focusing resulted from Kerr effect and plasma defocusing resulted from the multiphoton/tunning ionization [1,2]. Many nonlinear effects, such as fluorescence emission [3,4], terahertz radiation [5,6] and supercontinuum generation [7,8] *etc.* are involved in the process of filamentation. Among these nonlinear effects, the supercontinuum generation attracts a great deal of interest due to its potential and

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