

18

Role of Aging in the Formation of Non-Spherical Nanostructures During Laser-Matter Interaction in Water*

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Received September 21, 2019

Revised September 21, 2019

Accepted November 01, 2019

Pulsed laser ablation of different surfaces in liquid environment has broad prospects to selectively synthesize nanoparticles (NPs) with specific optical properties, as well as morphology, size and composition. The dependence of the morphology and particle size on the pulse duration and other external conditions allows synthesizing nano-sized particles for various scientific, particularly, optical, and industrial needs. Most previous studies on ablation of metals in water have shown spherical shapes of NPs without elaboration on the effect of aging on those shapes. In this study, we demonstrate notable modification in the morphology of aluminum, indium, zinc and copper NPs during aging towards the non-spherical structures, contrary to other laser ablation-induced spherical NPs from different elements in the periodic table.

Key words: laser ablation, multicomponent particles, agglomeration, cuboids

* Полный текст статьи опубликован в „Optics and Spectroscopy“ V. 127 N 6 2019.