

ABSTRACT

Diploma work: 91 pages, 31 figures, 11 tables, 50 sources, 1 app.

The objects of the research: the parameters of pulsed laser treatment, structure of metals with cubic-lattice, irradiated by the laser.

The objective of work: to optimize the parameters of pulsed laser treatment of metals with cubic-lattice, to obtain the desired structural changes.

By molecular dynamics the study of the process of pulsed irradiation of a cubic-lattice metal. It is shown that during irradiation of the sample by the laser in the mode of modulated q-factor, such point defects as vacancies and Frenkel pairs are formed. According to the model calculations and evaluations carried out, the irradiation of the copper samples with different parameters of pulsed laser treatment. Metallographic analysis confirmed the compliance of the resulting structural changes in the irradiated zones to specified structural changes. High-speed plastic deformation was detected, in during the formation of point defects, which is consistent with the simulation results.

Experimental and theoretical methods give the possibility to optimize the parameters of pulsed laser processing to obtain the desired structural changes and investigate them at the atomic level.

PULSED LASER TREATMENT, PULSED LASER RADIATION, OPTIMIZATION OF PARAMETERS, THE MODE OF MODULATED Q-FACTOR, VACANCY, FRENKEL PAIR