(n₁, n₂), and for Ho (Y) - at high (≥n₃) densities of the target. These features result mainly from non-equilibrium processes in the plasma due to variations of laser radiation absorption.

The analysis of the obtained experimental data allows the following conclusions:

1. Non-equilibrium distributions of the charge densities in two beams of ions (Ho and O) are revealed especially for low densities of the target (n=n₀). Inside low density target the non-equilibrium plasma forms, which can effectively absorb the laser radiation. Special additional experimental studies of dependence of the morphology of the targets on n after interaction with laser radiation confirm, that at n<n₃ the laser induced destruction is observed in the target volume.

2. It seems, that for n<n₃ not only n of target but also energy exchange is important when Coulomb collisions between ions of different mass (Ho and O) takes place during the inertial expansion of the two-element plasma.

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MASS-CHARGE SPECTRA OF MULTICHARGE IONS FORMED BY LASER IRRADIATION OF TWO-ELEMENT TARGETS

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Investigation of physics of plasma formation, heating of plasma using laser radiation, transformation of powerful coherent light into kinetic energy of charged particles and conversion of infrared radiation into short-wave one using non-linear optical mediums (ions, plasma) are actual. It is known that monoelement plasma formed by laser radiation, is rather well investigated. Note that earlier, to realise the controlled thermonuclear synthesis (LiD, CD₂) and the laser mass-spectrometer, based on single charged ions NaF, NaCl, NaI, CuCl₂, PbCl₂ and Pbl of laser plasma, were used two-element targets.

In the present work we studied mass-charged spectra of multicharged ions formed by laser irradiation of the two-element targets. In the tests we used the laser spectrometer combined with the electrostatic analyser [1]. There used Se₂O₃ and Lu₂O₃ as a target, which had density ~ 4.4 g/cm², diameter 1.0 cm and width 0.5 cm [2]. The laser allowed to get the density of power q=10⁸-10¹¹ W/cm². Mass and charge spectra and changes of multiplicity of
charges $Z$ of ions $\text{Se}_2\text{O}_3$ and $\text{Lu}_2\text{O}_3$ are obtained experimentally depending on element composition of the target and density of power of the laser.

The analysis of mass-spectra of ions $\text{Se}_2\text{O}_3$ and $\text{Lu}_2\text{O}_3$ obtained by the laser radiation in the interval of $\text{O}$ and $\text{Se}$ ($\text{Lu}$) shows that mass-spectra of the investigated elements is generally consists of ions $\text{O}$ and $\text{Se}$ ($\text{Lu}$) in various ionised states. Growth of power of laser's radiation leads to increasing of mass composition of spectra. The charge composition of spectra of ions $\text{S}_2\text{O}_3$ and $\text{Lu}_2\text{O}_3$ strongly depends on the laser power density, increasing of which leads to the growth of the charge multiplicities $\text{O}$ and $\text{Se}$ ($\text{Lu}$) ions of the two-element laser plasma.

The maximal multiplicity of ion's charge of $\text{O}$ and $\text{Se}$ ($\text{Lu}$) achieved when $q=10^{11}$ W/sm$^2$ and $Z_{\text{max}}$ of ions of $\text{O}$ and $\text{Se}$ ($\text{Lu}$) are equal 2 and 3 respectively. Let's notice that $Z_{\text{max}}$ of ions of $\text{O}$ and $\text{Se}$ ($\text{Lu}$) don't depend on the nature of the targets, but in the interval of the density of power of laser radiation $q=10^8-10^{11}$ W/sm$^2$ it has non-linear character. Since the density of power $q>10^9$ W/sm$^2$, the evaporated substance is ionised largely and the most of energy of the laser impulse is absorbed in the forming plasma, leading to increase of temperature and degree of ionisation of the target atoms.

The mechanisms of ionisation of atoms of two-element targets generated by the laser radiation are explained and possible experimental outcomes in scientific and applied aspects are discussed.


**INFLUENCE GAMMA RADIATION ON STRENGTHENING OF POLYCAPROAMIDE WITH ADDITIONS**

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Doping the oriented crystalline polymer with polar groups (polycaproamide) by inorganic polar molecules KJ$_3$ (KJ + J$_2$) results in approximately 50% increase of polymer sample strength. The strengthening took place at the insertion of admixture in amorphous regions of the oriented polymer without change of its crystal structure. The strengthening is consequence of inter-chain intermolecular bond formation between the passage amorphous macromolecular sections and inorganic polar groups of the addition. But the polymer-inorganic complex was unstable to thermal treatment. The addition was removed causing appropriate reduction of polymer strength at as low temperature as 100 C.

Gamma-radiation resulted in increase of thermal stability of mentioned complex and preservation of the strengthening influence of the addition.