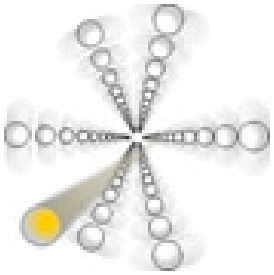

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Nuclear Synthesis On Ordered Crystal Target With Participation Of Monochromatic Beams Of Light Or Middle Isotopes

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In ordered crystal lattice very strong influence of crystal axes and planes electrical field on motion and interaction of fast charged particles with crystal atoms and nuclei exists. In works [1,2] it was shown that in monocrystal targets like possibility of fusion process with the participation of both target nuclei (e.g.) and beam of fast nuclei (e.g.), directed at Lindhard angle, increases by 10-100 times relative to the possibility of alternative process of deceleration on atomic electrons. Such changes are based on the usage of specific channeling physics regime of motion - "overbarrier motion". At such regime the processes of spatial redistribution and dechanneling of accelerated ions take place. In the report the methods of optimization and practical realization of such nuclear fusion are discussed in details.
The additional method of radical optimization of fusion processes with the participation of monochromatic beams of middle mass isotopes is proposed. It is well known that the presence of the Coulomb barrier is the main obstacle to performing nuclear reactions of synthesis with low energy of interacting nuclei. In order to make such reaction possible, it is necessary to place interacting particles in the same spot simultaneously (within the range of atomic force action). In this case, the cross section of nuclear reaction depends on the energy of reciprocal movement of nuclei and matches the "internal atomic cross section". The features of optimized nuclear fusion model, with the use of accelerated average-mass ions beams and condensed-surface targets, based on resonant tunneling effect were considered. Optimization process based on the using of conditions for the interaction of nuclear beam and target, for which "internal cross-section"of fusion exceeds the cross-section of crystal low-level cell, and resonant tunneling effect provides the full transparency of reaction barrier. The use of particle beams with optimal energy and small (but real) energy distribution, which correspond to total transparency "window"of reaction barrier, as it was shown, leads to the possibility of positive nuclear fusion energy release on one atomic monolayer [3]! Such effect can be regarded as nuclear super absorption of accelerated beam. The possibility of nuclear reactions and at such motion regime with positive energy release was examined.

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