Physical nature of metals longevity in the dynamic failure phenomenon

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At present acute is the knowledge of time boundary of maintaining functional metal properties under extreme conditions, when the equilibrium state deviation value is comparable with phase transition energy. As a rule, relaxation of strongly non-equilibrium states is accompanied by destruction processes [1, 2]. The main problem of studying the metals behavior under extreme conditions is determining the physical mechanisms of non-equilibrium system relaxation, for example, metal samples exposed to high-level penetrating radiation. It is shown that the physical nature of metals longevity under in the range of non-equilibrium state $t \sim 10^{-6} - 10^{-10} sec$ is specified by the time of forming critical concentration of failure centers cascade.

This work is done by support from RFFR # 09-01-12062

References

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