

1.7.18. STRUCTURAL REGULARITIES OF THE ACOUSTIC EMISSION SIGNAL GENERATION IN STEEL

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Introduction. The research is dedicated to the study of connection between the parameters of acoustic emission (AE) signals and the size of cracks and grains at steel deformation.

Various researchers suggest the importance of grain borders, as the sources and blockers of micro-cracks. But there is no consensus on the element of structure, which is responsible for the formation of micro-cracks. The majority of researchers confine themselves to the study of the middle size grains connection with the strength and plastic properties. Therefore, the study of size influence of different components of polycrystalline structure on the size of forming micro-cracks was of particular interest. In the meantime, it was necessary to find out, whether the connection between the size of micro-cracks and the amplitude of AE signals remained the same at the change of the grain's size. The preservation of such connection would confirm its justness and would show that the basic source of discrete AE in constructional steels is the formation of micro-cracks.

The description of research. The study of connection between the size of micro-cracks, formed by the deformation of constructional steels, and the parameters of AE signals by the sizes of structural grains, is executed on the 08GDNFL steel, subjected to different forms of thermal processing.

Conclusions. The existence of united dependence of the AE signal amplitude on the size of an occurring micro-crack, resulted from the size of structural elements, confirms the conclusions that the basic source of AE signals in constructional steels is the occurrence of micro-cracks, while the character of distribution of the micro-cracks by size and, consequently, distribution of the AE impulses by amplitudes, is defined by the distribution of the sizes of structural elements.