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On ultra dispersed statuses iron-graphitic of alloys

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On the basis of the new theory of graphite formation at hardening iron alloys are developed and the ways of manufacturing of iron alloys with ultra-dispersed by structure of carbon are experimentally tested. The ways are based on preliminary creation in smelt of uncontinuities, which surface at hardening becomes covered by a film of free carbon lowering power expenses for formation inter phases of surfaces. Influencing on it was possible to adjust a set uncontinuities, number and sizes of formed particles of free carbon, and in alloys of iron to increase local density of inclusions on 6—8 orders.

With application of intensive heating of the deformed high strength pig-iron the statuses are received, in which the number of spherical inclusions of free carbon reaches 10^{13} cm^{-3}. The conditions of formation ultra dispersed of structure of alloys, kind of a surface of the unit partial melted of a zone and its dependence on spatial orientation of the deformed graphite are investigated, the role of preliminary deformation of pig-iron is considered, the mechanisms of eutectic crystallization smelt, formed in result partial melted are analyzed, the role of thermal processing is described. Is shown, that in partial melted sites of the deformed pig-iron eutectic crystallization is realized by two ways: with formation of the shell austenite around of carbon particles; with formation of spherical particles without a covering austenite, which is allocated on previously formed excessive austenite.

Thanks to ultra dispersed of particles of free carbon the size of a grain of ferrite in a metal basis only on the order exceeds a diameter of inclusions of free carbon, which close partial melted of graphite makes ~ 1 micron. The partial melted sites inherits a kind deformed graphite, that, in a combination to the subsequent thermal processing, allows in a wide range to influence structure and properties of the processed pig-iron. In result of processing change hardness durability and viscosity, grow resistance to corrosion and deterioration etc. With application partial melting is made itself grinded the cutting tool. The quality of alloys can be increased plastic deformation.

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