Study of effect on divorced eutectoid transformation of GGr15 by deforming processing in the two-phase zone

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ABSTRACT

The Gleeble-3500 testing machine is used to simulate process of plastic deformation in two-phase region of austenite and carbide and to be done in higher temperature zone of eutectoid transformation range also both for GCr15 steel. Two deformation passes are used in two-phase region, and one deformation pass is done in higher temperature zone of eutectoid transformation range after the start and end temperatures of eutectoid transformation of GCr15 are measured, respectively, by using the Gleeble-3500 testing machine. The influence on austenitize grains and remained carbide morphology of deformation being conducted are investigated by means of scanning electron microscopy. The hardness of samples is measured with hardness testing machine. The impacting on precipitation, growth, and morphology of carbides of divorced eutectoid transformation taking place in GCr15 is investigated while plastic deformations are conducted. The results show that the plastic deformation has effect on austenite grain size and amount of remain carbide in austenite. The deformation could help divorced eutectoid transformation and promote the spheroidization of carbides in GCr15 steel. The hardness of the sample of GCr15 steel is significantly reduced after divorced eutectoid transformation taking place. And the time of the spheroidization of the carbides in GCr15 steel is great shortened.

KEYWORDS: bearing steel, divorced eutectoid transformation, spheroidization of the carbides