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The effect of varient heat treatment cycles on controlled surface graphitization in CK45 steel

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Abstract

Controlled graphitization has become known as a practical method for improvement of wear resistance and machining properties in steels. In this paper, the effect of heat treatment on microstructure of CK45 steel has been investigated. Austenitising was carried out at 920°C for 5 hours. Besides, isothermal transformation was conducted at 750°C in the time range of 1-20 hours. The microstructure of the steel considerably changes by this heat treatment process which exhibits the effects of temperature, appropriate austenitising duration and isothermal transformation. Conducted experiments show a suitable distribution of semi-spherical graphite particles especially on the surface of the steel. Also, analyses demonstrate that the amount of formed graphite in the austenitising temperature 920°C is more than graphite in single heat treatment temperature of 750°C.

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