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Study for the evolution of Reoxidation products in Ti-added Al-killed Ultra Low Carbon Steel

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The background of this study is the expected increase in slag oxidation caused by the expansion of low HMR operation in the process of applying low-carbon steelmaking.

Ultra-low carbon steel is particularly used in products that require excellent formability, such as automotive exterior panels.

Ultra-low carbon steel is typically alloyed with Ti to form Ti(C,N). Therefore, the mechanism of formation in Ti-containing steel was investigated.

The study on the evolution of reoxidation products in Ti-added, Al-killed ultra-low carbon steel was performed using high-temperature confocal microscopy

and samples from an industrial plant, coupled with the thermo-chemical program FactSage.

The deoxidation product in ultra-low carbon steel was alumina. If the molten metal is exposed to air, however, complex oxides containing FeO-TiO_x-Al₂O₃ inclusions form in ultra-low carbon steel.

The mechanism for the formation of reoxidation products in ultra-low carbon steel was suggested.

This finding provides grounds for preventing reoxidation, which causes nozzle clogging and surface defects in the steelmaking process.

Speaker Country

Korea

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