



Contribution ID: 1  
Paper

Type: Oral Presentation - Presentation will be held without submitting a Full Paper

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

Wednesday, 21 May 2025 11:00 (20 minutes)

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  $\text{FeO-TiO}_x\text{-Al}_2\text{O}_3$  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

### Are you interested in publishing the paper in a Steel Research International special issue?

**Primary author:** Dr CHA, woo-yeol (Steel Products Research Laboratories, POSCO)

**Co-author:** Dr KIM, Wan-yi (POSCO holdings)

**Presenter:** Dr CHA, woo-yeol (Steel Products Research Laboratories, POSCO)

**Session Classification:** Impact of changed raw material mix on BOF process and secondary metallurgy

**Track Classification:** Impact of changed raw material mix on BOF process and secondary metallurgy