

# Carnegie Mellon University

## Materials Science & Engineering

*presents*

### **Development of High Al Lightweight Steel for Automotive Applications – Ongoing Efforts on Process and Product Aspects in GIFT, POSTECH**

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#### **ABSTRACT:**

Increasing demand to lower CO<sub>2</sub> emission from several steps of steel production and its application leads to several activities including decreasing the specific density of steel product that is used for automotive. Al is one of the typical candidates to lower the specific density of steel. Increasing Al content in the steel influences several aspects of steel product and processing. Precipitating Al containing phase appears in the steel matrix that enhances physical performance of the steel product. However, up-stream processing of the high Al steel faces up to some challenging problems. In this talk, recent research activities carried out at POSTECH are introduced including core idea of alloy design and its physical performance, new thermodynamic analysis of Al deoxidation for steel cleanliness control, and severe chemical interaction between liquid steel and flux during continuous casting for mass production

#### **BIOGRAPHY:**

Youn-Bae Kang was educated at Pohang University of Science and Technology, South Korea (Ph.D. in materials science and engineering). After postdoctoral work in Ecole Polytechnique de Montreal in Canada, he joined the faculty in Graduate Institute of Ferrous Technology at Pohang University of Science and Technology. Now he is an associate professor, leading a research group Clean Steel Laboratory. His research expertise is in solution thermodynamics and reaction kinetics, with particular emphasis on a high-temperature reaction between liquid steel and relevant materials (slag, inclusion, refractories, etc.). His research interests include high-temperature chemical metallurgy to be applied to steelmaking, refining, and casting process of steel. Combination of high-temperature experiments with computational thermodynamics and reaction kinetics have been used in order to develop new refining process, recycling of ferrous scrap, improving steel cleanliness. He has been awarded by several academic societies including TMS, ASM, Korean Institute of Metals and Materials, and National Academy of Engineering of Korea. He has published over 180 scientific papers.

**Doherty Hall 2210, 11:30AM  
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