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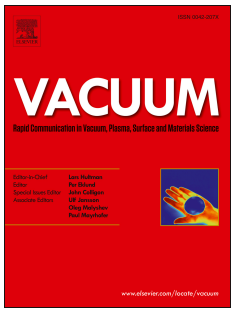

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Circulation Flow Rate and Decarburization in the RH Degasser under Low Atmospheric Pressure

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Abstract: The pressure difference between the atmosphere and vacuum vessel is the driving force to make the molten steel to be suctioned into the RH vacuum vessel where decarburization occurs. The circulation flow rate of molten steel has a decisive influence on the decarburization efficiency. In this work, a VOF–DPM coupled model has been developed to investigate the multiphase flow in the RH degasser, and a decarburization model has been built to predict the variation of [C] in molten steel during degassing. Based on the created models, the influence of atmospheric pressure and snorkel immersed depth on circulation flow rate and decarburization has been clarified. The calculated circulation flow rate and decarburization rate agree well with the measured results. The result indicates that the decarburization of the RH degasser under low atmospheric pressure at high altitude will be significantly weakened due to that the drop of atmospheric pressure will remarkably decrease the circulation flow rate of molten steel. The snorkel immersed depth is suggested to be increased from 0.5 to 0.75 m to increase the circulation flow rate from 90.5 to 120.9 ton/min and thereby decrease the [C] in molten steel after degassing from 0.002–0.0023 to 0.0014–0.0017 wt%.

Key words: RH, VOF–DPM, atmospheric pressure, decarburization, circulation flow rate