Results of Research into the Segregation Behaviour of Manganese, Silicon and Chromium in Continuous Casting

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For different steel grades the segregation factors of several alloying elements, both for crystal and for centre segregation, have been determined using electron probe microanalysis (EPMA). With this method two-dimensional quantitative concentration images for several elements are assigned. The segregation factors depend on the chemical composition of a steel grade, in particular on its carbon content. Within a category of steel grades, the segregation factor will increase with increasing carbon content. For the first time, a large number of tests were performed on 53 slab samples from different steel grades to establish the segregation factors. The effects of the slab thickness, soft reduction and carbon content on crystal and centre segregation have been investigated. The results are essential for modelling the segregation phenomena occurring at solidification.