On the Unusual Fluorescence X-Ray Intensity Variations in Iron-Silicon and Aluminium-Silicon-Copper Alloys*

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Abstract

The unusual fluorescence X-ray intensity variations in iron-silicon and aluminium-silicon-copper alloys have been investigated. In these alloys, the unusual behaviour was found not only in the fluorescence X-ray intensity of the Si Kα line but also in that of Fe Kα. It was confirmed that the phenomenon occurred not only when the primary crystals having large differences of the mass-absorption coefficients for the X-ray of the elements to be analyzed precipitated on both sides of the eutectic point and/or the intermetallic compound but also when there was a large difference in the effective volume ratio between the primary phase and the secondary phase. Therefore, the phenomenon should be considered in the fluorescence X-ray analysis of actual samples such as alloys of light metals, ores, oxides, and other compounds.

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