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Direct-Reading, Time-Resolving Technique in Emission Spectroscopy and its Application to the Analysis of Iron, Steel and Iron Ores*

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Abstract

An attempt of the time-resolution of emission spectra was carried out using a simple pulse generator by impressing a gate pulse on the dynodes of a photomultiplier tube in the direct-reading spectrometer. Examinations were made on the variation of the intensity of spectral line with time in various atmospheres and it was confirmed that the after-glow is the longest in an argon atmosphere. The possibility of avoiding the effect of an interfering spectral line lying close to the analytical line was examined and this was proved to be possible with the analytical line of Si I 2881.58Å and the interfering line of Cr II 2881.93Å. The analytical line of calcium, Ca II 3933.67Å, is interfered by Fe I 3933.61Å and the effect of the spectral line of iron was avoided by the use of the time-resolving technique. This permitted the rapid determination of 0.001~0.1% of calcium in iron ores by the direct-reading spectrographic analysis.

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