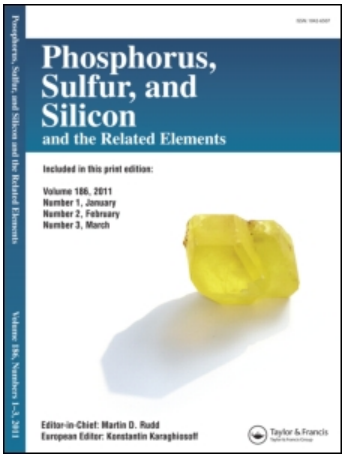

Phosphorus, Sulfur, and Silicon and the Related Elements
Publication details, including instructions for authors and subscription information:
http://www.informaworld.com/smpp/title~content=t713618290

The Phase Equilibriums and the Structure of Some Calcium Silicophosphates

E. L. Krivoviazov[a]; A. A. Baikov[a]
[a] Institute of Metallurgy, Academy of Sciences of the USSR, Moscow, USSR

To cite this Article Krivoviazov, E. L. and Baikov, A. A.(1990) 'The Phase Equilibriums and the Structure of Some Calcium Silicophosphates', Phosphorus, Sulfur, and Silicon and the Related Elements, 51: 1, 445
To link to this Article: DOI: 10.1080/10426509008040969
URL: http://dx.doi.org/10.1080/10426509008040969

Phosphorus, Sulfur, and Silicon, 1990, Vols. 51/52, p. 445
Reprints available directly from the publisher
Photocopying permitted by license only

THE PHASE EQUILIBRIUMS AND THE STRUCTURE OF SOME CALCIUM SILICOPHOSPHATES

E.L.KRIVOVIAZOV
A.A.Baikov Institute of Metallurgy, Academy of Sciences of the USSR, Leninsky Pr. 49, Moscow 117911, USSR

The formation of silicophosphate phases in calcium orthophosphate and disilicate system determine the metallurgical and agrochemical properties of the steelmaking slags, which produce phosphorus ores in the process of metallurgical treatment of iron. We used the IR-spectroscopy in combination with the traditional methods of phase analysis, such as the X-ray and crystaloptic methods. The IR-absorption spectra were recorded on the IR Fourier spectrometer in the range 400-4000 cm^{-1} in the vacuum observing the necessary conditions of the quantitative analysis. The optical characteristics (optical density, the parameter which is proportional to the integral intensity were calculated by computer. The latter are in correspondence to the antisymmetric valency vibration for the ions SiO_4^{4-} and PO_4^{3-}. The isothermical (at 950 and 1520^{o}C) and some polythermical cuts of the above system were investigated. The concentration and temperature dependence of the optical characteristics had the special points, which corresponded to the phase diagrams. The latter we had studied by other methods. The positions of the diagram points, which correspond to the forming substances as well as to the eutectoid points, were refined. Some alterations in the IR-spectra, particularly in the part which corresponds to Si-O vibrations, were explained by the change of the basic motive of the structure from the "larnite" to "garnet" with the increase of the orthophosphate concentration. The coordination number of calcium changed from 6 to 8. The investigations of phase equilibriums made it possible to syntesize the basic individual phases.