

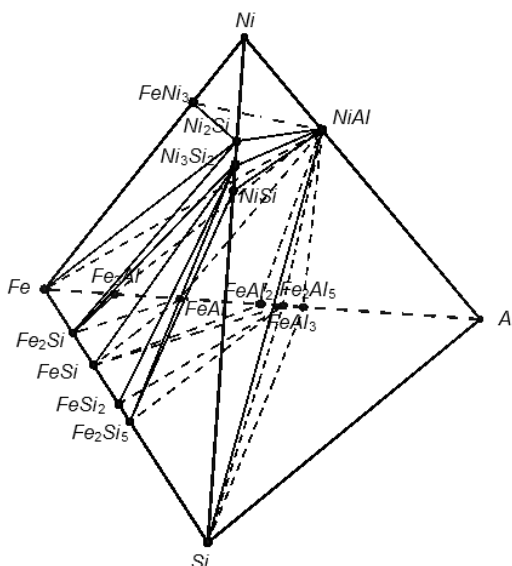
### PHASE DIAGRAM OF THE Fe–Si–Al–Ni SYSTEM

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Using the thermodynamic–diagrammatic analysis method, the optimal compositions of complex ferro-silicon–aluminum–nickel alloys were determined, along with the construction of phase relationship diagrams for individual sections in the Fe–Si–Al–Ni system [1, 2].



Phase diagram of the Fe–Si–Al–Ni system

In the Fe–Si–Al–Ni system, it can be seen that in order to produce ferrosilicoaluminum nickel with the highest nickel content, it is necessary to aim for the region of the Si–Fe<sub>2</sub>Al<sub>5</sub>–NiAl–Al tetrahedron, which has the largest volume (0.2978). The optimal alloy composition is: Fe = 9–10%; Al = 17.21%; Si = 65–68%; Ni = 0.5–4%.

1. Baisanov S., Tolokonnikova V. V., Narikbayeva G. I. Korsukova I. Ya. Thermodynamic substantiation of compositions of silicon aluminium alloys with increased aluminium content in Fe-Si-Al system // *Complex Use of Mineral Resources*. – 2022. – Vol. 321, No 2. – P.31–37.

2. Baisanov S. // *Proceedings of the thirteenth international ferroalloys congress «Efficient Technologies in Ferroalloy Industry» INFACON XIII*. – Almaty, 2013. – Vol. II. – P. 60-620.

*This research was funded by the Science Committee of the Ministry of Science and Higher Education of the Republic of Kazakhstan (Grant № AP26194293).*