Igor Seleznev
S.S. Fedorov, research supervisor
I.P. Nikitina, language adviser
National Metallurgical Academy of Ukraine, Dnipropetrovsk

## Experimental Research of Electrical Resistance in a Bubbling Fluidized Bed

Due to constant increase in demand for graphite there is a need to improve and optimize its production technology.

Electro-thermal fluidized bed furnaces are widely used abroad for carbonaceous materials processing. The principle of operation of such furnaces is conversion of electricity into heat. The electric current passes through the bed from the central electrode to a graphite lining.

Fluidized bed is the best application for particulated graphite. This method permits intensive mixing of material in the bed and results uniform temperature distribution.

However, we should take into account the dependence of the electrical resistance of a fluidized bed on the number of factors, such as: temperature, velocity of fluidizing agent, moisture, bed porosity, graphite fraction, and many others.

Fluidization (or fluidisation) is a process similar to liquefaction whereby a granular material is converted from a static solid-like state to a dynamic fluid-like state. This process occurs when a fluid (liquid or gas) passes up through the granular material.

The fluidized layer represents a condition of two-phase system which is characterized by movement of solid particles relative to each other because of energy exchange with any other source.

The main objective of this work was an experimental study of the electric resistance of the material in a fluidized boiling layer. A series of experimental studies of a fluidized layer of graphite electric resistance on "cold" physical model was carried out.

Experiments were made for a graphite layer in 200, 300 and 400 mm respectively. Air supply was carried out through an electrode and lattice. During the experiment graphite condition characterized as a state of "fluidized bed" was achieved.

Proceeding from the obtained data, dependence between a consumption of air (speed of inert gas supply) and resistance of a fluidized layer of graphite was established. As a result, the influence of a method of feeding and fluidization regime on electric resistance of the layer of graphite was established.