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A. Petryshchev[1], M. Dmytrevych[2]
[1] доц. НУ «Запорізька політехніка»
[2] студ. гр. Е-219 НУ «Запорізька політехніка»

IMPROVING THE LEVEL OF LIFE SAFETY IN THE RECYCLING OF TECHNOGENIC METALLURGICAL WASTE

Waste of alloyed heat-resistant, heat-resistant, corrosion-resistant and other grades of steel and alloys, the operation of which may be accompanied by exposure to aggressive environments, temperature and mechanical factors, contains high-cost elements. These elements include nickel, chromium, tungsten, molybdenum, niobium, and others [1]. At the same time, prices for the corresponding alloying materials on the world market have an increasing trend [2]. These materials are widely used in all branches of the national economy. A specific feature of waste is the presence of alloying elements in the form of oxide and complex compounds. This makes it necessary to take into account the complex nature of the physico-chemical interaction of elements in the development of technological conditions for processing [1]. A significant part consists of oxide and fine waste (scale, grinding dust), the effective processing of which is difficult, which negatively affects the manufacturability of production and the cost of production [1].

The current state of metallurgical production is characterized by the formation of a significant amount of waste that accumulates in dumps, occupying areas of possible cultivated land and polluting adjacent territories [3]. Ferroalloy production is also a source of environmental pollution [4]. Especially dangerous for the environment is the presence of heavy metals in waste, which include chromium and nickel, which pollute the soil [5] and underground water [6]. chromium and nickel belong to the 2nd hazard class (moderately dangerous) according to the degree of danger of exposure to living organisms. Once in the human body, chromium and nickel cause poisoning. For example, in residential areas, the maximum permissible concentrations of chromium and nickel are 400 and 140 mg/kg, and in industrial facilities – 1000 and 900 mg/kg, respectively. It follows from the above that the processing of chromium-nickel-containing waste from metallurgical production makes it possible to prevent contamination of land and water resources with heavy toxic elements. At the same time, the occurrence of diseases in people who would come into contact with a polluted environment is prevented [1].

So, the problem of reducing the losses of refractory elements in the processing of waste from high-alloy steels and alloys is urgent. For this purpose, it is necessary to study the features of physico-chemical transformations in the reduction melting of doped oxide metallurgical waste. Processing and return to production of industrial technogenic waste of metallurgical production ensures not only the development of resource conservation, but also the reduction of environmental pollution along with an increase in life safety [1].

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