



ISSN: 2350-0328

**International Journal of Advanced Research in Science,  
Engineering and Technology**

**Vol. 6, Issue 2, February 2019**

# **Development of a Technique of Definition of Effective Extent of Metallization Poor Iron Ore Raw Materials in the Context of Local Conditions**

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**ABSTRACT:** Iron ore fields of Uzbekistan belong to the category of the poor, complex, difficult processed raw materials. These ores before loading in the furnace need to be enriched and subjected to the metallized roasting. In this case it is extremely important to define effective extent of metallization since it is connected with more material expenses. It is shown that when determining extent of metallization it is necessary to consider a type of initial material, its stocks and technical and economic indicators of process. It is shown what at along with industry factors needs also to be considered a number of variable factors. The type of fuel, reducer, development of infrastructure, presence of consumers, etc. belongs to them.

**KEYWORDS:** the technique, effective extent of metallization, poor iron ore raw materials, local conditions, enrichment, concentrates, is mesmerized, metallization, melting in metallurgical furnaces.

## **I. INTRODUCTION**

Now in domestic and foreign technical and economic researches it is observed different the points of view about the level of production efficiency of the metallized raw materials and its processing [1, 2]. Different incomparable conditions of comparison and imperfection of techniques of carrying out economic calculations are basic reasons of it. In a number of researches of an economical calculation have private character, do not reflect all the aggregate active of industry and economic factors. These circumstances predetermined need of consideration and justification of the basic methodical provisions by economic assessment of metallization of iron ore raw materials and its use when smelting cast iron and steel in specific conditions of our republic.

## **II. RELEATED WORK**

At assessment of production efficiency of the metallized raw materials it is necessary consider on work force of action of the following objective variable factors [3]:

- Type of initial iron ore raw materials, its resources and technical and economic characteristics;
- A way metallurgical processing of metallized raw materials in steel;
- Way of metallization of iron ore raw materials and their technical economical index;
- Way of metallization of iron ore raw materials;
- Structure of metal charge in steel-smelting production, and consequently, and structure of steel-smelting repartitions;
- Structure of steel works, their capacities and economic indicators;
- Capital investments and the current costs of implementation of an action for protection of the surrounding environment from harmful emissions.
- Along with industry factors it is also necessary to consider actions of a number of variable factors in an economic section. Treat them:
  - Type of fuel-reducer, its resources and technical and economic characteristics;
  - Economic conditions of areas of development and placing uncoke metallurgy;
  - Land, hydro-electric, ecological conditions and resources of areas of placement of steel works;



ISSN: 2350-0328

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Vol. 6, Issue 2, February 2019

- range of transportations of iron ore raw materials, materials, fuel and finished goods at development of small-scale metallurgy;  
- improvement of quality of the metal products received with use of the metallized raw materials, and significant improvement of utilization properties of machines, the equipment, building constructions.  
Some industry it is also national economic variable factors are complex and for quantitative impact assessment them on efficiency of metallization of raw materials it is necessary to open the economic maintenance of these factors.

### III. OBJECTS AND METHODS OF RESEARCH

Let's consider the industry factor characterizing changes of structure of a metall-charge of steel-smelting production when receiving the metallized raw materials that is followed by change of structure of steel-smelting repartitions in the industry. With arrival to the industry of a new source of primary iron (the metallized pellets) at a given volume of production of steel from balance of raw materials of steel-smelting production scrap metal is forced out. Therefore, at a research of efficiency of use of the metallized raw materials in this or that steel-smelting production an indispensable condition is economic assessment of intra-branch structural shifts. [4.5].

For impact assessment of change of a ratio of a blend on efficiency of use of the metallized raw materials we developed a technique according to which the effect of remelting of the metallized raw materials is determined as a result the calculation of costs of one middle-mixed ton of steel in general by the industry. At the same time calculation are made both taking into account and without costs of a scrap that allows to eliminate influence of the scrap assessment factor which is not connected with this problem.

The technique the calculation given of costs of middle weight industry ton of steel at assessment of efficiency of use of the metallized raw materials is rather convenient at a solution task manufacturer degree as in this case all balances on a metalblend and a range of the melted steel are easily considered and controlled. This technique can be well implemented at a research of alternative versions of the scheme of development and placement of ferrous metallurgy on perspective [6.7].

To other complex variables a factor, reflecting its influence on change of the current and capital expenditure in industry and in economic cuts, development of small-scale metallurgy (mini-plants) on the basis of the metallized raw materials is. This direction is the most perspective for development of ferrous metallurgy of Uzbekistan.

All the matter is that now JSC "Uzbeksteel" entirely uses secondary raw materials and experiences difficulties with its deliveries. Providing plant initial can be significantly facilitated by material at putting into operation of iron ore fields of the republic [8].

In Uzbekistan is available several iron ore fields having industrial value [9].

First of all, it should be noted the iron ore Syuren-ata field located in the territory of Bostanlyk and Parkent districts of the Tashkent region. Resources of iron ore are defined in 44-49 million t. The average content of iron, depending on section fluctuates from 15-49%.

Temirkan deposit it is located in Farish district of the Jizzakh region. Reserves of ore make about 128 million ton a board of 25%

As a result of long-term search, prospecting and evaluation works, technological tests of ores it is established that the most perspective object which can pass the Tebinbulak field which is located near the city of Turtkul in the Republic of Karakalpakstan into discharge of the industrial phenomena. Forecast reserves of ore are estimated at more than 1 billion t. The average content of the main components is: gland of 16.2%, dioxide of titanium of 2.0%, five-oxide of vanadium of 0.15%.

It should be noted that all reserves of iron ores in Uzbekistan are counted on category C2 when capacities are determined on the basis of studying of exits of layers of ore to a day surface and also by purely theoretically reasons. Ore reserves on category C can be used only at advance planning of development of metallurgy and are insufficient to start design of steel works. Translation of fields into categories B (probable stocks) and A (manufacturer stock) we can enter significant correctings to capacities of an ore field.

Whether in developed situation in the row there is a need and expediency construction of the big plant on site arrangements of raw sources.

### IV. RESULTS OF THE RESEARCH

In our opinion a problem of effective development of ferrous metallurgy of Uzbekistan should consider a reasonable combination of the mini-plants along with the powerful metallurgical enterprise. This problem to must be consider



ISSN: 2350-0328

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from the economic point of view as task is optimal level of production concentration. In turn, definition of optimum ways of development of communication is based on systems analysis of an entity and factors, providing to increasing final production efficiency of ferrous metals.

The major objective and permanent factors, determining the level of an absolute construction of steel works, the regional need for ready steel products on the volume and a range minimization of costs for production and consumption of metalwork, technical progress in production and consumption of steel products, the level of regional security with natural resources are [10].

Now in JSC "Uzbeksteel" significantly raised efficiency of electro-steel-smelting production by commissioning of the "AKOS" unit and transition to technology, the Furnace ladle. At the same time more powerful transformers were used and it is applied the system of an intensification of melting, "SIT-CPP" it allowed a part of operations on smelting of steel and its refinement is taken out on furnace units that allows to use capacities of transformers more fully. As a result of it melting duration is reduced, the specific consumption of the electric power is cut, the prime cost and capital intensity of electro-steel approaches level martin and converter processing.

It is in our opinion most expedient to organize production of steel in Uzbekistan according to the following scheme. Works are recommended to be begun with the Tebinbulak field which has the most considerable reserves of iron ore. On this field it is recommended to construct small concentrating factory, power 1-2mln. ore t a year. Experience of such factory in Uzbekistan is available. Recently the factory on a Hondiza field in the Surkhandarya region was constructed. The concentrate from this factory for further processing is transported to Almalyk.

Enrichment making on two technologies is recommended. At the beginning after crushing and crushing of ore on a concentration table with allocation, non-magnetic hematite. Tails from a concentration table will subject went 11 for allocation of magnetic fraction. Experience of such organization to the Republic is also available. So, in Navoi mountain iron and steel works on concentration tables allocate a gold head, and allocate with magnetic separation magnetic fraction. The received two types of a concentrate with the maintenance of 55-65% can be transported in Bekabad.

## V.CONCLUSION

The organization of extraction of ore on the field did not present any difficulties. All the matter is that there mining works are already conducted. Ore is extracted in the open way by the Turtkulmash organization and produces from it construction filling brick. This filling brick is used as construction mineral at construction of different object.

In Bekabad directly of proximity from the DSP-4 furnace it is offered to construct the tubular rotating calcination furnace. This furnace will burn the pellets prepared from a concentrate (70-80%) and coke dust (20-30%). It is necessary for preparation of pellets mount not big the dish-shaped granulator.

Pellets will burn in the furnace at temperatures of 1150-1250 °C and with extent of metallization of 95-98% hot they can be loaded into the chipboard furnace. It will give the chance economy of the electric power for 20-30% since it is essential to decrease heat expense on fusion of burdening materials.

All listed above types of education and units are rather simple in a design and can be made in the Navoiy engineering plant [11].

The organization of such production will allow to involve local iron ores in an industrial turn, will create new jobs, will organize a direct source of raw materials for ferrous metallurgy of Uzbekistan and to refuse considerably import of metal scrap from the countries of the FSU and beyond.

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