EuroSciCon

International Conference on
Metal, Mining and Magnetic Materials

November 01-02, 2018
Paris, France

Andrey N Dmitriev et al., J Mat. Sci. 2018, Volume:6
DOI: 10.4172/2321-6212-C7-032

PROCESSING OF TITANIFEROUS MAGNETITE ORES WITH VARIOUS CONTENT OF TITANIUM DIOXIDE

Andrey N Dmitriev, Galina Yu Vitkina and Roman V Petukhov
Institute of Metallurgy-Ural Branch of Russian Academy of Sciences, Russia

The results of laboratory, industrial and calculation researches of physical, chemical and thermophysical processes at the oxidizing roasting (sintering and pelletizing) of the titaniferous raw materials are considered. The estimation of influence of metallurgical properties (reducibility, durability, softening and melting temperatures of roasting ores) on processes heat and mass exchange at the reduction in the blast furnace (two-dimensional fields of gas and charge temperatures, degrees of iron reductions, cohesion zone) is executed. Titan-bearing ores with the various TiO2 content are investigated. Tests of ores are provided by ores of the current production in the Gusevogorsky deposit (average test), and also ores from separate production of ores - is low titanium and is high titanium. Ores of the Kuranakhsky deposit, the Tebinbulaksky deposit (Republic of Uzbekistan) and high titanium ores of the Medvedevsky deposit and the Yaregsky deposit allowing receiving pigmentary titanium dioxide are also considered. Processing of the specified ores assumes so-called schemes «blast furnace - converter» and «metallization - electro melting», including oxidizing roasting of ore concentrate with receiving agglomerate and pellets. The micro X-ray diffraction phase analysis and magnetic characteristics of samples is made. The results of industrial tests on change of metallurgical properties of agglomerate and its influence on blast furnace indices are given. Technical and economic indices of blast furnace smelting of agglomerate and pellets (consumption of coke and productivity, chemical composition of cast iron and slag), received from a concentrate of the Kachkanarsky deposit, are calculated. The mathematical model of blast furnace process is considered. As a whole possibility and reasonability of processing of titaniferous ores with the different content of titanium dioxide and receiving vanadium containing cast iron and the slag containing titanium dioxide is shown. **Work is executed with financial support of the State Task of Institute of Metallurgy of the Ural Branch of the Russian Academy of Sciences, the Project No.0396-2015-0081 and the Russian Foundation for Basic Research, the Project No.16-08-00062**

Biography

Professor, Doctor of Technical Sciences, Chief Research Officer of Institute of Metallurgy of the Ural Branch of the Russian Academy of Sciences, Professor of Ural Federal University, Academician of Russian Academy of Natural Sciences, Academician of Academy of Engineering Sciences of Russian Federation. Area of research interest - development, perfection of mathematical models and their use for the analysis and optimization of processing of ores.Has graduate from Metallurgical Faculty of Ural Polytechnical Institute (nowadays Ural Federal University, Ekaterinburg, Russia). It is awarded with the Honourable Diploma of a Student's Scientific Organization. Achieved awards: Honourable Letter of Russian Academy of Sciences, V.E.Grum-Grzhimajlo Premium-Medal, Honourable Letter of Government of Sverdlovsk Region, Silver Medal «Metal-Expo'2014», Award of Governor of Sverdlovsk region, Diploma of 1 degree and Gold Medal of the Petersburg engineering fair, Medal and Order of Academy of Engineering Sciences named A.M. Prokhorov «For a contribution to development of engineering sciences». The author of 6 monographs, more than 300 papers and 12 inventions.

andrey.dmitriev@mail.ru