

Development of a method for integrated use of hydrogen and biomass as environmentally friendly sources of energy and carbon in the metallurgical industry.

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The aim of the project is to develop a complex technique to use hydrogen and lignocellulosic biomass as environmentally friendly sources of energy and carbon instead of fossil fuels (coal, natural gas) and coke in metallurgical processes. Hydrogen is an environmentally friendly fuel with high specific energy, the use of which allows replacing fossil fuels in metallurgy while increasing the efficiency of high-temperature metallurgical processes and reducing harmful emissions. In addition to the function of fuel, fossil fuels in metallurgical processes act as a reductant metals. This function is performed by a source of renewable carbon of biomass. Complexed use of hydrogen and lignocellulosic biomass in metallurgical processes, namely sintering (pellet production), blast furnace, direct reduction and arc electric furnace is to be studied experimentally and allows providing new knowledge and development of scientific and practical solutions for rational and environmentally safe use of hydrogen and biomass in technological processes metal production. According to the fact that the metallurgical industry uses a large share of fossil fuels, the development of the use of alternative energy sources is to contribute to the independence of the fuel and energy complex of Ukraine, as well as energy and national security. The development of the technique of using hydrogen and biomass in metallurgical processes is an interdisciplinary and complex task that requires appropriate scientific approaches and practical test runs. The results of the project are to be of great interest for the metallurgical industry and have a global priority, as well as have socio-economic significance.