

of science and technology, as stocks of raw materials as well as replenished anthropogenic materials is necessary for normal operation of enterprises [1–6]. For example, during the process of producing nonferrous metals a great number of substances forms: slag wastes, slime of irrigated suspensions of nano- and micro-dispersed particles, dust, and the discharged gases. In order to produce construction materials and products (especially those of special purpose, in other words, designed to operate under the impact of high and low temperatures, aggressive environments, grating and hit-vibration strains, etc.). First of all, granulated slags and slimes (nepheline, bauxite, sulphate, monocalcium, etc.) have industrial significance [2]. Works, aimed to study physical-chemical, mechanical, and technological characteristics of multi-tonnage slag wastes, produced during the procession of nonferrous ore, have shown that production of construction materials can utilize slags, received from procession of copper and nickel ores that excel furnace slags in such characteristics as durability and acid resistance [1, 5]. Granulated slags are an alternative to siliceous component in production of materials of autoclave curing; their implementation is also possible in receiving heavy concretes that are dense, fine-grained, light on porous fillings, and porous [1]. Slags of nonferrous metals, processed into stone and small filling can be the most efficient way to solve problems in the area of environment preservation and utilization of wastes after the extraction of valuable components [1, 5]. Slime wastes (byproducts of processing alumina-containing material) can be used in production of cements: kaolin slime is close to Portland cement in its chemical composition, belit slime (nepheline) is used in production of highly-active cements [1, 2, 4]. Apart from cement production, nepheline slime is also utilized in production of construction bricks, blocks, plates; in road construction it is used to fortify soils of underlayer; in production of binding for asphalt-concrete, output of fire-resistant bodies, colored glass, etc. [1, 4]. Another perspective approach is discharge of independent concentrates (for example, molybdenum concentrate from copper-molybdenum ores, copper and bismuthic concentrate from tungsten-molybdenum ores, feldspar concentrate from nonferrous metals, etc.) [3]; production of fire-resistant glues from the processed chromia-alumina catalysts and phosphate bindings [5], etc. Possibility of using disperse ashes – carryovers as aliminia silicate components of alkaline bindings was studied in works of V.D. Glukhovskiy and co-authors [2, 6]. In order to construct ash-alkaline bindings on alkaline components (sodium, sodium fusion cake, liquid glass), P.V. Krivneko, R.F. Runova, E.K. Pushkareva have suggested methods that imply combined graining of ashes or ash-slag compositions with lime or metallurgical slag and Portland cement clinker; however, regardless of utilization of the prepared disperse product – carryover ashes, production of such bind-

ing solutions requires grain of component combination, and it may limit introduction of the method into production in certain cases [2].

Thus, practical significance of implementing different wastes of nonferrous metallurgy in production of construction materials of special purpose does not cause any doubt. However, due to insufficient provision of technological aspects of utilization, part of the re-processed wastes at the enterprises of nonferrous metallurgy remains small, the greatest part of wastes is drained into storages or took to the drop. From our point of view, active utilization of multi-tonnage wastes of nonferrous metallurgy is not resent in the country, as their re-procession requires special physical-chemical technologies, linked to the basic sources of forming secondary materials.

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#### ABOVE US ONLY SKY

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The Soviet and America relationship changes regularly from cold war to peace friendship and cooperation. There is the possibility of widely changes in different field of science and cultural. One of the popular in the changes is the Centre of international program – Youth creators of the 21<sup>st</sup> century and people to people organization from the United States.

Our film call “Above us only sky” is developed to one of these meetings. One of the program leaders said about the American participating to the program

“we have an opportunity to feel of the wink of the soviet people, to share hospitality, to learn about cultural and history, especially, to learn about scientific matters and to share a little about America with the Soviet students, families and teachers. I hope that better understanding between our children. This is not a political program”.

Some years ago, one of dream such advanced, and it have been called a reality. The group of America students visited the Moscow institute of physics and technology. One day, the children visited the Aerodynamic and flight engineering department of the institute. The dean (Khlopkov Yuri Ivanovich) told the guests the developed of the faculty and developed of two major aerospace research centers located in Zhukovsky. One of them is the Central aerodynamic institute name after Professor Nikolai Zhukovsky. Fundamental investigating and differ-

ent field of aerospace science are held here. They visited the cosmonaut training center. The successful work jointed with space in 21<sup>st</sup> century is depends on them – today school program.

Not only jointed in physics classes, the study of Russian language is the children to understand one another. They spend time with some families to help and better understanding love about people.

They visited to the historical places. It is impossible to understand the background of the nation without learning their history and culture.

Unfortunately, it is time to drive their life. The great meeting, Soviet-American school of physics will present awarding the diplomas of the Moscow institute of physics and technology to all the participants. The servants of American delegation change the stage flag for their friendship. With hope such meeting will help our friendship.





In this film presented the origins of establishing relationship between the two great nations such a thin field as science. The program is fully justified. It gave the opportunity to start a fully exchange students, including between the universities as bright as the Moscow State University, Moscow Institute of Physics and Technology and Massachusetts Institute of Technology, and the Michigan University of Aerospace Engineering. And now, after so many outstanding achievements by the former Russian students, Russian students are studying in America and American students are studying in Russia when between us this film becomes special urgency! This paper is supported by Russian Foundation for Basic Research (Project No. 14-07-00564).

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**THE CRITICAL REGIMES OF FLIGHT AT HIGH ANGLE OF ATTACK (EXPERIENCE OF USE IN EDUCATION)**

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The work presents scientifically-educational video film “The flight at high angles of attack”. This video film is about the physical aspects and, mathematical models, wind tunnels experiments for the flights of airplanes at high angles of attack. Bright present aero physical experiments in the wind tunnels of Central Aero hydrodynamics Institute (TsAGI), flight experiments in Flight Research Institute (LII), mathematical models elaborated with Moscow Institute of Physics and Technology (MIPT). Besides it’s shown the role of this video film in the educational process of the Department of Aeromechanics and