

nogenic raw materials are that the raw materials are persistent for processing with use of traditional technological schemes. Thus cost of extraction of MPG from technogenic fields sometimes happens lower, than at enrichment of initial ores and sand as the expensive operations connected with production are excluded from a technological chain, by crushing, crushing and classification.

The essential circumstance constraining involvement of technogenic materials in processing, is that they are considered by the large mining enterprises first of all as the geotechnical systems providing long-term storage of mining waste, and to a lesser extent as secondary mineral resources. From these positions perspective concession development of technogenic platinum fields with use of modern hydrometallurgical technologies is represented.

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THE COMPOSITE BUILDING MATERIALS ON THE BASIS OF THE FOREST COMPLEX WASTE WOOD

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In the past two decades, the waste wood integrated management is given the quite serious attention and the consideration. So, the wood particle boards and the wood – fiber – glass panels production has been reduced, to some extent, the junk waste and the worthless waste products amount, but millions of tones of them are being left in the forests, in the woods, in the heaps of the woodworking plants, they are simply being burnt, and etc.

So, the waste wood use is quite presented the extremely topical and actual one, in the direction of the rather and the very valuable product receiving – the furfural, and also its derivatives. So, the furfural polycondensation with the acetone is quite allowed by us to be obtained the FAM resin, which is the bonding agent at the resistant – chemically

constructional and the lining composite building materials (CBM) production.

Thus, the CBM creation has been the main goal of our developments, with the high corrosion resistance, under the highly aggressive and the corrosive environment conditions of the electrolytic productions, and, in addition, they are able to be withstood the long operational loads. So, this type of the material has been called the fiber – glass polymer concrete (FGPC) [1], or, at the new terminology, – the fiber – glass composite material (FGCM).

So, the sufficient wetting by the resin (e.g. adhesive) of the fiber – glass reinforcement (e.g. the substrate), having contained the lubricant, and, having introduced into the polymer – concrete mixture during the molding process, is the necessary condition for the FGCM monolithic structure formation. For all this, there is: the micro- and the macro-fiber-glasses introduction into the resin; the adhesive large molecules diffusion to the substrate surface through practically almost remote lubricant's rather very thin layer, having deluted, as a result of the polymerization exothermic reaction high temperatures, and, then – the hydrogen bonds adequate strength establishment, having closed the adsorption process. So, the system hardening, which is followed by the oligomers' molecules cross – linking, is the last stage of the strong adhesive bonds creation, in the section zone of the fiber – glass – polymer matrix.

Thus, we have already used, at the same time, three theories – the surface wetting theory and the mechanical and the molecular adhesion theories, for the bonds formation mechanism to be explained in the section zone. The lubricant is played the plasticizer layer role, which is helped to be increased the FGCM strength, as a result of the shear stress local removal, having generated in the section zone of the fiber – glass – polymer matrix, due to the large shrinkages of the FAM resin, and also, in view of the elastic moduli and the thermal expansion coefficients difference of its components. So, the polymer matrix environment does not affected negatively upon the fiber – glass reinforcement main properties, having provided the FGCM high long – termed strength and the stiffness, having operated under the liquid aggressive and the corrosion media of the chemical productions, the increased temperatures (e.g. up to 100°C), and the electric current conditions. So, the proposed theoretical conditions viability of the FGCM monolithic structure formation has been confirmed experimentally [1; 2]. The FGCM on FAM has been shown the high efficiency at its use, as the structural material of the processing bath enclosures, the tanks, the settling tanks [3], the chemical – resistant precast monolithic floors, having subjected to the complex exposure of the constant load, the liquid and the gaseous aggressive and the corrosive media, the temperature, and the electric current.

So, this material can be used for the housing units of the wood – chemical productions, for ex-

ample, the slush collection in the process of the thermal decomposition of the wood, the energy chemical plants and the installations for its further processing, the acetic acid productions by the extraction method, the special equipment in the ethyl acetate, the furfural production, and also in the WFGCM outer layers, in order to be further improved its fracture strength.

So, the new direction in the Forestry and the Woodworking industries – is the creation on their basis the sleepers and the ties for the railways, including the timber – carrying, the logging, and also the street car and the subway routes.

If we consider, that the sleepers and the ties service life in the way is made up 13–19 years (e.g. 156–228 months), therefore, it is in 6–7 times less, than the reforestation term of this age. So, the main reasons and the causes of the wooden sleepers and its ties out of their service is their mechanical wear and the decay, and it is the primary reason and the cause is exactly the deterioration and the wear, because of which from 30 up to 60% of the stacked sleepers and the ties are being failed at all. Thus, this is explained the main reasons and their causes of their acute shortage.

So, the FAM resin, and also the wood [3, 4, 5] preliminary analysis chemical composition and the main properties have been permitted to be highlighted the following working hypothesis: the new constructional corrosion – resistant wood fiber – glass composite material (WFGCM), the matrix of which the FGCM [1] can be served, having described above, and the reinforcing filler – the wood chips, is quite able to be created at the theoretical basis and the experimental verification of such fact the FAM oligomer compatibility and the wood.

So, the potential chemical reactivity of the WFGCM components concerned us has already been identified. As it has been noted above, the wetting, which is followed by the second act of the FAM and the wood interaction – the physical adsorption, having carried out by the Van-der-Waals forces is the initial warranty examiner occurrence connection between the resin (e.g. adhesive) and the wood (e.g. the substrate). So, it its turn, the physical absorption is taken its place, simultaneously, with the dipole – dipole interaction, and, in this case, there are the hydrogen bonds. The molecules structural diagrams analysis of the WFGCM interacting components, having formed the FAM resins – mono- and difurfurilidenacetones and the wood – cellulose and the lignin, has been shown the hydrogen bonding emergence possibility by the dipole – dipole interaction and the interaction of these hydroxyle groups to be formed the ester bonds scheme, which is contributed to the durable adhesive joints in the section area between the phases, which has been confirmed, experimentally. So, the process is ended by the system hardening, having led to the wood reinforcing filler compression, due to the shrinkage forces [2, 3, 4]. From the above material, it is quite clear, that the

adhesive joint emergence process is very complex, and its phases are interwoven in time.

So, the return on the capital investments in the sleepers' production from the WFGCM is taken its place in four times quicker, in comparison with the composite ties, having used in Japan. They are much convenient to be carried out, with the terms of their operation for the all types of the railways owners, and, above all, the timber industry complex – the main furfural producer, having obtained from the wood waste, and the reinforcing filler – the wood chips.

As the need in the corrosion – resistance structural materials in the RF and abroad is quite huge and enormous, then the forestry industry and the wood chemistry productions may be their main suppliers. So, this will be improved the environmental and the social situation in the regions, having harvested and the processed timber, since they can be used in almost practically all the waste timber complex; the new jobs and the working places will be created, which is very significant and extremely important at the development present stage of the Russian State.

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VIRTUAL SCIENTIFIC SOCIETY AND NETWORK TECHNOLOGIES AS FACTORS OF INDUSTRIAL AND INNOVATIVE DEVELOPMENT

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Presently science has acquired a number of new peculiarities. Evidently, formal sciences have taken leadership roles. This is attributed to the internal and external reasons. Development of the easily accessible personal computers, wide usage of Internet, transmission of 3D images, development of