COMPOSITES REINFORCED WITH FIBERS OR FIBROUS CRYSTALS

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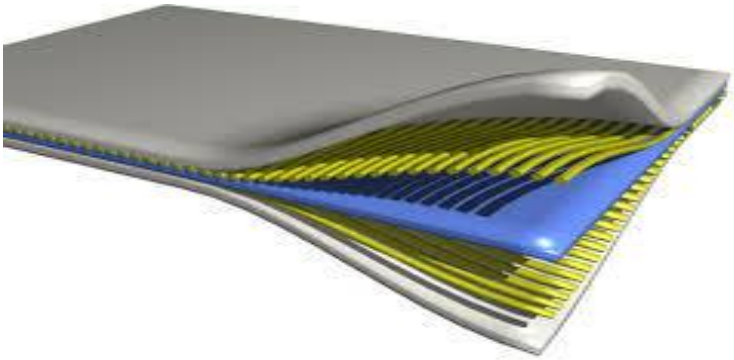
Abstract: *In this article, the types of composite materials and their development, fields of application, and technological methods of preparation are widely covered.*

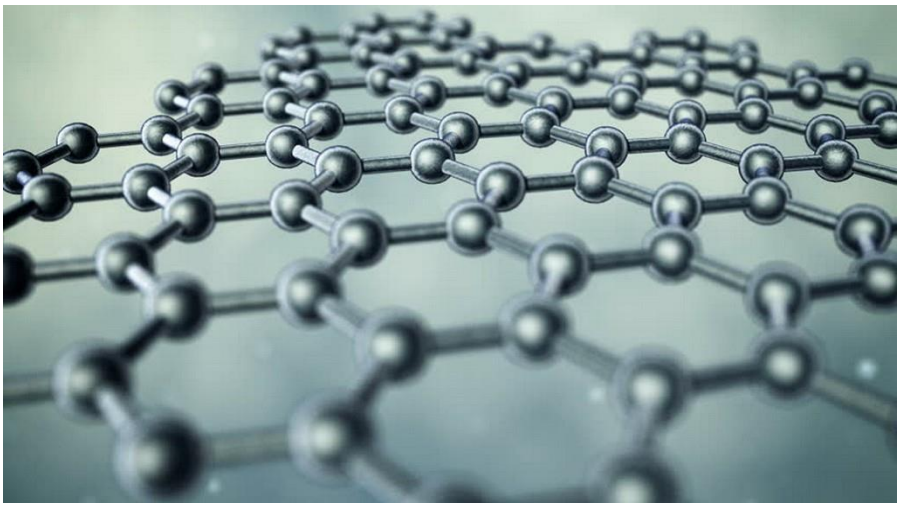
Key words*: Composite materials, dispersed particles, inorganic, fibrous crystals, diffusion method.*

Today, the world has stepped into the development of new techniques and technology. As a result of the development of science and technology, great changes are taking place in metallurgy. New types of products are being produced instead of metal. For example: the best material to match steel or aluminum alloys is composite or composite materials. According to the encyclopedic materials, the meaning of "Composite" is given as follows: "Metallic or non-metallic materials with reinforcement in a given direction. Composite materials are materials that are formed by the volumetric union of chemically different components (mixtures) that do not interact with each other, and the components are separated from each other by a clear boundary.

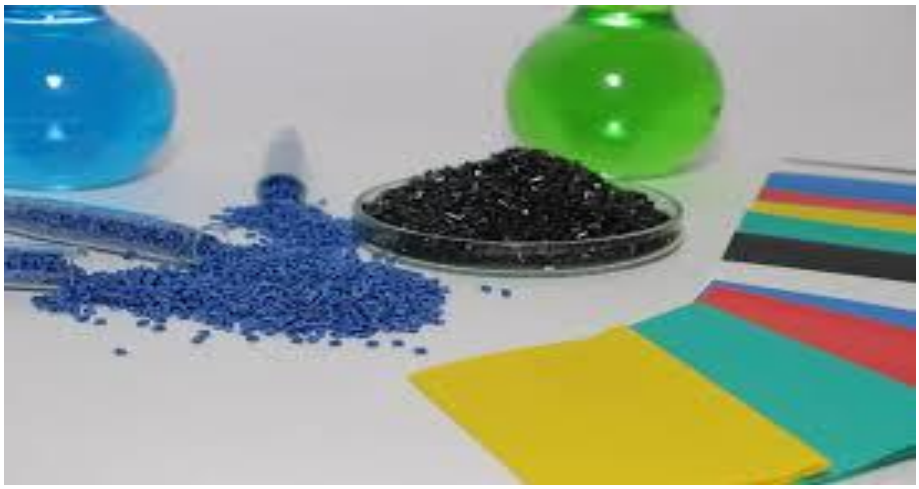


Composite materials are characterized by indicators that are not unique to any of them, as they combine the best properties of each component (strength, corrosion resistance, etc.). Usually, composite materials consist of a plastic (metallic or non-metallic - inorganic or organic) base or matrix and additives: metal powders, fibers, fibrous crystals, thin fibers, gas, etc. Types of composite materials: fibrous (reinforced with fibers or fibrous crystals); dispersion-densified (reinforced with dispersed particles) and layered (different materials are pressed or rolled). Important technological methods of preparation of composite materials: impregnation of matrix material on reinforcing (reinforcing) fibers; molding of reinforcement and matrix tapes in a press mold; cold pressing of components

and then welding; spray the matrix on the reinforcement and then clamp; diffusion welding of multilayer tapes of components; rolling reinforcing elements together with the matrix, etc.



Composite materials are used in aviation, aerospace, rocketry, automobile industry, machine building, mining industry, construction, chemical industry, textile, agriculture, household appliances, radio engineering, energy, pipe production and other industries. One of the modern composite materials is reinforced concrete. It is known that during the production of reinforced concrete, the concrete hardens around the steel reinforcement. As a result, it is a unique monolithic product, concrete works mainly in compressive force, reinforcement in tensile force. It can be seen that the development of composite materials is aimed at using the good properties of the base and the reinforcement. As an example, we can take glass plastic.



Science and technology is achieving good results in the production of construction materials. If in 1940 the strength of quality steel was 110-130kg/mm2, in 1985 it reached 200-250kg/mm2. In high-strength aluminum alloys, it has a tensile strength of 40 kg/mm2 and 50-60 kg/mm2 (1940s and 1985s, respectively). The effect of the above factors increases with extremely low temperature, vibration loading, fatigue crack development, corrosion increase or decrease, relative strength and uniformity of common materials. In the material, the sensitivity to the concentration of stresses near the holes and various sections increases, the corrosion resistance decreases, and the

probability of the occurrence of cracks increases. In other words, when robustness is increased, reliability of use may decrease. As an example, let's look at the history of aluminum alloy.

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