RARE MATERIALS USED IN FOLK CRAFTS

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Abstract: *This article describes the rare materials used in folk crafts. It is well known that ferrous metals form the basis of machines and mechanisms in all industries of the world, so the technical growth of each country is expressed by the degree of melting of ferrous metals, the remaining metals and their alloys belong to the group of non-ferrous metals.*

Key words: *copper, copper ores, beneficiation, washing, grinding, flotation, pulp, conversion, crude copper, pure copper, electrolysis, anode, cathode, aluminum ore.*

A metal is a non-transparent body that is shiny, plastic, conductive, and conductive. In engineering, all metal materials are understood as metals and can be divided into 2 groups: simple or ordinary metals (relatively pure from other chemical elements).

According to Mendeleev's periodic table, 3/4 of the existing elements are metals. The rest are non-metals. Despite the abundance of metals, very little is used in industry.The main industrial metal is iron (Fe), which combines with carbon (C) to form ferrous metals.

Ferrous metals make up 93% of the metals used in the engineering industry. Ferrous metals form the basis of machines and mechanisms in all industries around the world. Therefore, the technical growth of each state is characterized by the degree of melting of ferrous metals, the remaining metals and their alloys belong to the group of non-ferrous metals. Non-ferrous metals of industrial importance are copper - Cu, aluminum - Al, magnesium - Mg, lead - P, zinc - Sn, tin, etc.

Because non-ferrous metals are expensive, the industry tries to use ferrous metals as much as possible to replace them. In addition to the above-mentioned non-ferrous metals, chromium Cp, nickel Ni, manganese Mn, molybdenum Mo, cobalt Co, titanium Ti are also used in industry. These metals are mainly basic materials, additional materials to improve their properties, to give them certain properties. For example, B, W, Ti, and Co are used to make cutting tools. We call all of the above metals technical metals. Platinum, gold and silver are said to be rare metals.

The properties of the most common and common rare alloys in industry and technology are much higher than those of ordinary metals, and hard, demanding, alloys of various properties are obtained. The most widely used of the common metals are copper and aluminum, which are used to make electrical wires and other parts.

Non-Metallic Chemicals The most important non-metallic elements in industry are oxygen, carbon, nitrogen, hydrogen, phosphorus and sulfur.

In engineering, a compound of nitrogen – ammoniagas – isused to harden the surface of steel, nitrogen.

Oxygen is used in industry to weld and cut metals, to accelerate the metal production process in blast furnaces and converters.

Used in the production of various metal alloys, in the grinding and grinding of metals, silicon carbonate SiC is used.

Sulfur is found in very small amounts in cast iron and steel.

Carbon is found in the form of diamonds, graphite and coal.

The properties of steel and cast iron depend on the amount and condition of carbon.

Phosphorus R is rapidly present with many metals and is present in all carbon compounds of iron. Phosphorus and sulfur are harmful elements in steel.

In order to use metals and alloys properly, it is necessary to know their properties and the conditions under which these properties change. Studies have shown that metals and alloys change their properties as their internal structure changes.

The science that studies the internal structure of metals is called metallography.

Solids are divided into amorphous and crystalline.

Atoms of amorphous substances are arranged randomly, they break in a chaotic direction even when they are broken, and their fragments do not have flat surfaces. gradually softens and liquefies when heated, they do not have a specific melting and solidification temperature. The word amorphous means formless.

All metals and alloys have a crystalline structure. The atoms of crystalline matter are arranged in a precise spatial geometric pattern.

Depending on the conditions, some substances can be amorphous and sometimes crystalline (rubber, glue, etc.). The science of crystals is called crystallography.

Crystalline substances have atoms of specific liquefaction and solidification, their atoms have certain geometric shapes, and their properties vary in different directions, a property called anisotropy.

The mechanical strength, heat and electrical conductivity, rate and temperature of liquefaction of crystalline substances depend on their atomic structure and their properties. When crystalline substances break down, their fragments also have a flat surface, and sometimes they can be seen to be compacted.

Crystals are often obtained from solutions. When the solution is heated, the solvent evaporates to form crystals. This phenomenon is called crystallization. Depending on the crystallization conditions, the crystals can be fine or coarse-grained.

Large crystals are formed when the solution evaporates slowly at low temperatures and small crystals when evaporated at high temperatures and cooled rapidly. Fine-grained steels are hard and coarse-grained steels are soft. A large crystal that grows regularly can be obtained around a small crystal formed. This process is called crystal growth. All metals and alloys have a crystalline structure. Crystalline grains are geometrically shapeless, crystalline-polygonal on the outside, and are called crystalline grains or granules.

Original metal ore deposits include gold, platinum and silver deposits. The largest reserves of the original metal ore deposit rarely reach tens of thousands of tons and are usually tens, hundreds of tons (for example, 1 ton of ore rarely contains more than 10 g of gold (0.001%). will be). Gold ores are found in gold quartz and other hydrothermal veins and stockworks (for example, in the Northeast, Western and Eastern Siberia, the Urals, Kazakhstan, Central Asia, the Caucasus, etc.).

Uranium (radium) and thorium deposits form a radioactive metal ore deposit. Hydrothermal and sedimentary deposits play an important role in uranium ore deposits. Thorium ores are organically related to granitoids and alkaline rocks; The main part of the metal contains accessory minerals (monasite, zircon, xeno-tim, orthite). Some of the thorium is concentrated in pegmatites and the rest in Sn, Pb, Zn, Ag, Co, Ni, U and other ores.

Gold plating - a thin (from a fraction of a micron to a few microns) gold coating on the surface of the product; in which case the item is decorated, protected, or protected as well.

Silver plating - a galvanic coating of silver on the surface of products in order to protect them from corrosion, make them shiny and decorative.

Palladium is the galvanic coating of metal objects to protect them from corrosion or to make their surfaces reflect light well.

Platinum – 1) electrochemical coating of a thin (1-5 microns) layer of platinum on the surface of metal products to increase their corrosion resistance, light-reflecting properties, corrosion resistance, as well as to maintain the constant electrical conductivity of the contact. Platinum is used in the manufacture of special laboratory and chemical equipment, parts for electrical appliances (contacts made of copper and its alloys), in the manufacture of molybdenum wires for electronic discharge pipes, in the jewelry and watch industries. 2) Chemical coating of a thin layer of platinum on the surface of substances (asbestos, alumina) in the manufacture of catalysts.

Platinum alloys are alloys of platinum (base) with other parent metals, most commonly rhodium (up to 40%), palladium (up to 50%), iridium, as well as nickel, cobalt, chromium, tungsten and molybdenum. Most corrosive media are characterized by corrosion resistance, high mechanical properties, and in many cases as a catalyst. Resistive furnace heaters are used for electrical contacts, thermocouples, as flammable and corrosion-resistant materials in the chemical and other industries.

Rare metal ore deposits include tin, tungsten, molybdenum, mercury, beryllium, tantalum, niobium.

Tin ore is extracted from the hydrothermal sulfite-cassiterite and quartz-cassiterite deposits in Kolima, Primorye Territory, ZabaykalskyKrai. Tungsten ores are found in hydrothermal vein and tungsten stockwork, as well as in scheelite deposits in skarns. Molybdenum ores are mined from stockwork and vascular hydrothermal deposits, skarn deposits. All mercury ore is extracted from hydrothermal deposits. Among the various sources of beryllium ores are pegmatite and hydrothermal quartz and beryllium (with fluorite), greisen and skarn (with gelvin and phenakite), volcanic fluorite-bertrandite and gelbertrandite deposits. Tantalum ores and niobium ores are mined from igneous deposits ranging from nepheline syenites, carbonates, albites and pegmatite’s.

Scattered elements are found in sedimentogenic, magmatogenic and metamorphic sulphur deposits of ore and are separated as by-products in the processing of ores in these deposits.

Ore deposits of rare earth elements belonging to the series and yttrium groups are found in magmatic, pegmatite, carbomatite, albitite, hydrothermal deposits and deposits of non-ferrous, rare, radioactive metals.

Tungsten alloys are alloys of tungsten with metals (molybdenum, rhenium, copper, nickel, silver), oxides (TNO_2), carbides and other compounds. The main advantages are high liquefaction temperature, large modulus of elasticity, low coefficient of thermal expansion; disadvantages – lowplasticity and oxidation resistance at room temperature. Products and semi-finished products of tungsten alloys are mainly melted by powder metallurgy, rarely in vacuum arc and electron beam furnaces, and then deformed. Used in nuclear power, aerospace, electrical engineering, electronics and others.

Molybdenum alloys are molybdenum-based alloys with the addition of tungsten, rhenium, zirconium, titanium, niobium, carbon and other elements. Constructive, heat-resistant molybdenum alloys include alloys of molybdenum with titanium (0.5%), zirconium (0.08%) and carbon (0.02%). Parts made of molybdenum alloys can work in vacuum for a long time at a temperature of up to 1800°C, with a protective coating in the air for a certain time at 1200-2000°C. Molybdenum alloys are used in the manufacture of important parts of missiles and other aircraft, nuclear power, electronics and other fields of technology. The main advantages of molybdenum alloys are high heat resistance, disadvantages – low flammability and plasticity.

Molybdenum is the formation of a molybdenum coating on the surface of products made of steel, titanium, niobium and other metals. Molybdenum increases the hardness of materials, surface hardness, corrosion resistance to nitric acid, and increases the flammability at high temperatures with additional silicification. Molybdenation is performed by diffuse metallization.

Tantalum alloys are tantalum-based alloys with the addition of niobium, tungsten, zirconium, hafnium and other elements. Materials with high flammability and corrosion resistance in aggressive and liquid metal environments. Used in the manufacture of rocket nozzles, jet engine parts, electric vacuum devices and others.

Zirconium alloys are zirconium-based lead. iron. alloys of chromium, nickel and other elements. It is characterized by low retention of thermal neutrons, sufficient strength at 500-600°C, and high resistance to corrosion in water, alkaline and some acidic environments at high temperatures. Zirconium alloys are especially used in nuclear power.

Niobium alloys are alloys in which molybdenum, tungsten, zirconium, titanium, vanadium and other elements are added to niobium. High heat resistance, sufficiently technologically advanced, resistant to aggressive environments and corrosion of liquid metals. Some niobium alloys are highly conductive. Niobium alloys have a low flammability and need a protective coating for long-term operation at high temperatures. Used in nuclear power, chemical industry, rocket and spacecraft parts manufacturing.

Uranium alloys are uranium-based alloys containing molybdenum, zirconium, aluminum, niobium, chromium, tetanus, and silicon. Uranium alloys are stronger than pure uranium (under nuclear reactor operating conditions), have high corrosion resistance, and vary in size; the nuclei of the thermal reactors are made from uranium alloys in nuclear reactors.

References

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