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DISPOSAL AND REUSE OF ELECTROLYTES

The industrial application of electrolytes is the production of current sources and batteries. Ionometers with electrodes filled with saline electrolytes and pH meters are used in analytical practice. They are used not only for measuring the pH level of the environment, but in the electrochemical industry. Electrolytes are the basis of solutions for galvanizing metals: chromium-plating, cadmium-plating, zinc-plating, gold-plating, phosphating, etc. Medicine and biology also deal with electrolytes. Diagnosis of many diseases is connected with the determination of water-salt and acid-base balance in the body. Most often we encounter acidic and alkaline electrolytes in batteries of vehicles without which they are unable to function. Both types have their advantages and disadvantages.

Figure 1 - Liquid electrolyte


Figure 2 - Solid electrolyte

An electrolyte is a superionic battery filler consisting of sulfuric acid and vitriolic oil, or a substance capable of conducting an electric current.

An alkaline electrolyte is a solution of alkali in water. Sodium, potassium, lithium hydroxide or combinations of these are usually used. An acid electrolyte is a solution of concentrated sulfuric acid in water.

The disposal of the electrolyte is a complex process as it can have serious consequences for the environment, so specialized firms with the necessary permits should be contacted. Waste electrolyte can vary in concentration and purity of highly toxic liquids. Cupric oil often refers to the darker types of sulfuric acid, represented by its technical grades (brown electrolyte). Electrolytes are used in both solid and liquid form (in batteries, for purification and production of metals, for anodizing and nickel plating processes). Lack of technology can lead to disorganized discharge of electrolyte into water bodies, soils, and sewage systems, which leads to an environmental disaster.

All types of electrolyte are dangerous and can cause irreparable consequences due to contact with them since they consist of oxides, salts, acids, polymers. Electrolyte recycling plays an important role because it makes it possible to reuse the recycled product as a raw material needed in certain industrial processes as well as for the recovery of sulfuric acid and its use in the creation of batteries. Two

methods are known for the utilization of sulfuric acid electrolyte. The first is neutralization with further discharge into drains. The second one is recovery to produce sulfuric acid. Adsorption, evaporation, thermal decomposition, coagulation, catalytic oxidation are used to obtain sulfuric acid from electrolyte. The most common is the flame method. The process is carried out under high temperatures with acid evaporating to desired concentration, resulting in a quality product. The cost of such acid is one third lower than the cost of virgin acid. Therefore, the use of secondary raw materials will give the opportunity to reduce the amount of sulfuric acid used in the automotive industry, as well as save the environment.