Electrolytic Etchant

Revision: 18th of August, 2020

PRODUCT NAME	ITEM NO.	SUPPLEMENTARY DETAILS
Electrolyte T1 (Part A)	92003011	With part B 1 l
Electrolyte T1 (Part B)	92003012	With part A 1 l

Description	Electrolyte for anodic etching and polishing of materialografic samples. The product is commonly applied for contrasting Titanium and titanium alloys (e.g. Ti-6-Al-4V).
Material	Part A: Ethanol 50-60%, (1,2-Propandiol) Any further additives do not surpass the threshold values for mandatory identification and can be considered nonhazardous additives. Part B: Perchloric acid 70.0 % Any further additives do not surpass the threshold values for mandatory identification and can be considered nonhazardous additives.
Properties	Part A: low viscosity, colorless liquids, alcoholic smell, flash point 13°C, the product can form explosive aerosols Part B: low viscosity, colorless liquids, characteristic acidic smell, ph <1, product may explode when heated, explosions may occur when mixing with flammable substances
Application	The component A and B must be mixed thoroughly before the first application of the electrolyte. Always add B to A and not vice versa, because this may cause a violent reaction. The etching parameter, voltage/current, etching time, pump throughput may strongly differ between materials. In general polishing applications require a higher current in comparison to etching applications. The etchant commonly must be cooled during application. During etching a DC voltage has to be applied. The sample is contacted with the anode. Occurring redox reactions ensure the contrasting of the microstructure or material removal. The applied parameters are strongly dependent on the etched material. Explosive combustion processes may occur if the medium is heated up, especially during the electrolytic process. Therefore, the temperature needs to be checked, it has to be ensured that the temperature of the medium does not surpass 35 -37 °C. The etched sample is rinsed with water and ethanol and dried under a hot air stream. The sample should not show a bright discoloration bit a slightly whitish discoloration. A microscopic analysis can be conducted. A repetition of the last grinding or polishing step ensures that the etching procedure can be repeated. The choice of the last mechanical preparation step strongly depends on the goal of the analysis.
Health and safety	The product should only be handled in a suitable fume-cupboard. Inhalative exposition needs to be minimized. Suitable protective clothing, protective gloves (fluororubber, 0.4 mm) and tightly sealed eye protection must be worn. In case of dermal exposition, the affected area must be thoroughly rinsed with water and soap. It is of utmost importance to prevent the material from overheating during application. In the case of fire, the product is a very strong oxidant. Water-spray, extinguishing powder and CO_2 are suitable extinguishing agents. The product should not be stored inside glass containers due to the associated risks in case of an explosion. Further information regarding first aid measures and safety instructions can be taken from the products SDSs.

Environmental precautions	Part B is assigned to water hazard class 1. Therefore, the mixture must be treated the same. The product should not get into phreatic-, surface waters and sewage systems. The product is hazardous waste and has to be collected and disposed separately. The disposal must be conducted according to local legislation. It is important to not dispose the electrolyte with certain chemicals and solids. The risk of explosion is given in the presence of metalloids, organic flammable substances, Fluor, HCl, Chromium (VI)oxide, phenol, phosphine, pyridine, sulfuric acid, steels, halogenated hydrocarbons, ethers, methanol, glycerin and other strong reductants.
Storage	The products are assigned to storage class 3 (part A) and storage class 5.1 A (part B). they must be stored in tightly sealed containers in a cool (3-30°C), ventilated and dry storage room. If a low temperature can not be guaranteed the storage compartment should be air conditioned at a proper temperature. The storage should be secured against electrostatic charging. Alternatively, the product must be stored inside the fume cupboard without being sealed tightly. The product cannot be stored next to reductants (e.g. sodium sulfit, zinc) or flammable liquids. It also must be kept away from ignition sources (e.g. flying sparks). Further storage related information is given by the products SDSs.