

**Etchant**

Revision: 19<sup>th</sup> of August, 2020

PRODUCT NAME	ITEM NO.	SUPPLEMENTARY DETAILS
<b>Kroll ´s Etchant</b>	92004492	1 l

<b>Description</b>	Etchant for visualizing microstructures. A common application in macro-etching is the visualization of Al welds. The commonly etched materials for microstructural investigations are titanium and titanium based alloys (e.g. Ti-Mn, Ti-V-Cr-Al alloys) and certain aluminum alloys (especially Al-Cu systems). The etchant is commonly known as Kroll ´s reagent.
<b>Material</b>	Nitric acid 5-20%, hydrogen fluoride 1-10% Further ingredients do not surpass the mandatory identification threshold values. Hence, they can be considered non-hazardous additives.
<b>Properties</b>	Liquid with low viscosity, colorless, with characteristic acidic smell. The pH value is <1 (20°C). The etchant is fully water miscible.
<b>Application</b>	Kroll ´s reagent is commonly applied as received; dilution is possible. Etching dishes made from polypropylene/polyethylene can be used. Any contact of the etchant with glass should be avoided. A polished surface (usually oxide suspension based final polishing is necessary) has to be present for microstructural investigations. During etching the sample is immersed in the medium. The sample should be moved during this process. The etching time differs according to the chemical composition of the sample. The etching time ranges from seconds to a few minutes. The etched sample should display a matte, whitish surface. The sample is then rinsed with water and ethanol. After drying, a microscopic evaluation can be conducted. The etching procedure can, after the removal of the etched layer, be repeated.
<b>Health and safety</b>	The etchant has to be applied in a sufficient fume-cupboard. The inhalation of generated aerosols can be life threatening and has to be avoided. The legal threshold values for the contained hazardous substances cannot be surpassed under any circumstances. Besides protective clothing, closed eye protection and sufficient protective gloves (fluororubber) have to be worn. Furthermore, calcium gluconate gel has to be stored at the workstation. In the case of dermal exposure, the exposed regions have to be cleaned with water and soap. The calcium gluconate gel has to be applied at once. Suitable respiratory devices should be stored for emergency situations. Further instructions for safety and first aid can be taken from the SDS
<b>Environmental precautions</b>	The liquid should be neutralized with strong bases (e.g. NaOH) before deposition. Kroll ´s reagent must not be released into phreatic-/surface waters or concrete foundations. The product is classified as aquatic toxicity class 2. The product may not be deposited alongside domestic waste. The deposition has to be conducted according to the legal regulations.
<b>Storage</b>	Kroll ´s reagent etchant belongs to storage class 5.1 B (TGRS 510). It has to be stored in tightly sealed containers in a cool (3-30°C) and dry storage. It must not be stored together with inflammable substances. A storage with goods classified as storage class 7, 6.2 and 5.2 is not possible. Furthermore, a storage with goods of the storage classes 10-13, 8A, 6.1 A-D and 5.1 C should be avoided. The storage facility should prevent the contamination of phreatic and surface waters and soil in case of an accidental release of the etchant.