Changes in this version:

* New SOP template
* New labelling
* Etc…

## INTRODUCTION/PURPOSE

This is a procedure including a detailed risk assessment for making 6 % Perchloric acid. 6 % Perchloric acid is used for EtOH concentration determination.

## NECESSARY SAFETY EQUIPMENT

|  |  |  |  |
| --- | --- | --- | --- |
|  |  |  |  |
|  | Nitrile |  | Fume hood |

## CHEMICAL AND BIOLOGICAL HAZARDS

### Chemicals

|  |  |
| --- | --- |
| **Chemical information** | **Health -, Precautions - and Emergency planning** |
| **Perchloric acid 70%**  [311421 from Sigma](https://www.sigmaaldrich.com/MSDS/MSDS/DisplayMSDSPage.do?country=NO&language=EN-generic&productNumber=311421&brand=ALDRICH&PageToGoToURL=https%3A%2F%2Fwww.sigmaaldrich.com%2Fcatalog%2Fproduct%2Faldrich%2F311421%3Flang%3Den)  CAS no: 7601-90-3  http://mnhms-dev.net/wp-content/uploads/2015/04/Helsefare.jpg | H271: May cause fire or explosion; strong oxidiser H290: May be corrosive to metals H302: Harmful if swallowed H314: Causes severe skin burns and eye damage H373: May cause damage to organs through prolonged or repeated exposure  P210: Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. P280: Wear protective gloves/ protective clothing/ eye protection/ face protection.  P303 + P361 + P353: IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower. P304 + P340 + P310: IF INHALED: Remove person to fresh air and keep comfortable for breathing. Immediately call a POISON CENTER or doctor/ physician.  P305 + P351 + P338: IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.  P371 + P380 + P375: In case of major fire and large quantities: Evacuate area. Fight fire remotely due to the risk of explosion. |

## Special cautions necessary due to reproductive toxicity:

Generally, it is not recommended to work with a chemical that has carcinogenic or reproductive effects if you are planning to be or are pregnant. If a chemical is proven to pass into breast milk it is not recommended to perform procedure if you are breast feeding.

Planning pregnancy (men and women): None

Pregnant: None

Breast feeding: None.

## PROCEDURES and risk assessment

### Procedure

**Necessary equipment:**

Pipettes

Pipet tips, assorted sizes

50 ml glass bottle

MQ water

Magnetic stirrer

*We always wear lab coat when working in the lab.*

1. Add approx. 40 ml with dH2O to a 50 ml glass bottle.
2. Transfer 4.3 ml 70 % perchloric acid to a 50 ml glass bottle.
3. Adjust the volume to 50 ml with dH2O (6 % perchloric acid).

|  |  |  |  |
| --- | --- | --- | --- |
| **Part of procedure** | **Unwanted scenarios** | **Necessary precautions** | **S\*K (Probability\*Consequence)** |
| 1-3 | Spillage of hazardous chemical | Wear gloves, goggles and lab coat. Work in fume hood  Add most of water before adding the acid  Locate nearest fire extinguisher | 2\*3 |

1. Mix on magnetic stirrer.
2. Label the bottle with 6 % Perchloric acid and hazard symbol according to the risk conclusion , date and your name and store in the fridge.

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| 4-5 | Spillage of hazardous chemical | Wear gloves, goggles and lab coat. Work in fume hood | 2\*2 |

### Labelling of new solution:

Please find relevant classification information from existing msds or confer with the [ECHA guide](https://echa.europa.eu/documents/10162/23036412/clp_en.pdf/58b5dc6d-ac2a-4910-9702-e9e1f5051cc5) for the correct classification and labelling of the solution (this might be quite time consuming).

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| **Perchloric acid 6%**  ([Information from Sigma 34288](https://www.sigmaaldrich.com/MSDS/MSDS/DisplayMSDSPage.do?country=NO&language=EN-generic&productNumber=34288&brand=FLUKA&PageToGoToURL=http%3A%2F%2Fwww.sigmaaldrich.com%2Fcatalog%2Fproduct%2Ffluka%2F34288%3Flang%3Den))  http://mnhms-dev.net/wp-content/uploads/2015/04/Helsefare.jpg | H315: Causes skin irritation. H319: Causes serious eye irritation  P280: Wear protective gloves/ protective clothing/ eye protection/ face protection.  P305 + P351 + P338: IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.  P337 + P313 I If eye irritation persists: Get medical advice/ attention. |

## WASTE DISPOSAL

When making this solution some waste is generated. It is important to access the potential risk this on the environment and how this waste should be handled.

| **Waste** | | **Volume** | **Disposal method** | **Environmental risk** |
| --- | --- | --- | --- | --- |
| 1 | 70 % perchloric acid  Disposal of chemical; too much volume taken out from bottle, the stock solution of 70% perchloric acid is out of date etc. | 0.1 – 100 ml | See chemical waste procedyre (Farlig avfall) | Chemicals for disposal are collected twice a year. According to procedure and handled with trained staff and collected by professionals. |
| 2 | Contaminated disposables or small chemical spillage with 70% perchloric acid; | 0.1 – 1 ml | Risk waste | The risk waste is handled by professionals |
| *3* | *6 % perchloric acid Rest of solution that is too old.   Rest for using solution to measure EtOH concentration* | *up to 50 ml* | *Risk waste*  *This is rescribed in separate SOP* | *-* |

## REFERENCES