**SOP for using the oxyhydrogen torch**

**Before using the torch prospective users must be trained by Chris Thomas (Ø-138) (for NAFUMA personnel) or Anja O. Sjåstad (Ø-130) (for other groups)**

* Wear face shield (welding face shield or welding glasses and ordinary face shield)
* Check that fume hood is on
* Check that all valves for both O2 and H2 are closed (gas cylinders, regulators and torch).

⚫ Open for H2-gas flow

1. Open main valve on H2-gas cylinder.
2. Open slowly 2nd valve on the wall
3. Check the pressure of first gauge on the wall (minimum allowed cylinder pressure 30 bar). The second gauge is fixed at 2.5 bar

⚫ Ignite flame on torch

1. Open the hydrogen valve on the torch, and ignite fire by match or spark lighter.
2. Adjust hydrogen flow to obtain an orange flame.

* Open for O2-gas flow

1. Open main valve on O2-gas cylinder.
2. Open slightly the 2nd valve on the wall (counter clockwise), and check the increase in pressure of first and second gauges on the wall regulator. Max operating pressure for second gauge is 2 bar.
3. Open carefully the oxygen valve on the torch and adjust flow to blue colour for use.

⚫ Adjust flame on torch for a short break (max 5 minutes)

1. Close oxygen valve on the torch
2. Adjust hydrogen flow on the torch to give an orange flame
3. Reset H2/O2 flame (after break) by carefully open oxygen valve on the torch and adjust flow to give blue colour.

⚫ Close H2/O2 gas flow at end of experiment

1. Close O2 tap on torch on – and main valve on H2-gas cylinder. The remaining gases in the lines will be treated in steps 2-5 below.
2. Burn remaining H2-gas in the line until the pressure of both first and second gauges on the wall decreases to zero. Close H2 valve on the torch then on the wall.
3. Close O2 cylinder. Release remaining O2-gas until pressure of both first and second gauges on the O2 by the cylinder becomes zero.
4. Close all valves on both H2 and O2 lines and assure both gas cylinders are in closed position. Do not over-tighten needle values.

**Remember to tidy workspace after use**

Report any problems or concerns to Christopher I. Thomas (Ø-138) or Anja O. Sjåstad (Ø-130)



welding glasses and ordinary face shield

Welding face shield



2nd gauge

1st gauge

2nd valve on the wall

Main valve on H2



H2 valve on Torch

O2 valve on Torch



2nd gauge

1st gauge

2nd valve on the wall

Main valve on O2

SAFE JOB ANALYSIS (SJA)

Name of unit: Department of Chemistry

This SJA concerns: hydrogen torch in room Ø150

Date: 1/11-2010, Agnieszka Gorzkowska-Sobas, Hiroshi Okamoto, Helmer Fjellvåg

Date: 20/3-2012: Christopher Ian Thomas, Anja O. Sjåstad

Date: 22/06/2012: Christopher Ian Thomas, Anja O. Sjåstad

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| **Subtask** | **Possible cause of undesired event** | **Precautions to be taken** |
| **Hydrogen gas** | Flammability/Ignitability | Turn on fume hood |
|  |  | Hydrogen gas must be always burned out. |
| **Sealing quartz** | Damage to the eyes | Do not look at melting part of quartz by naked eye |
|  | Damage to the face | Use face-shield for protection |
|  | Skin burns | Keep tidy work place, and maintain good housekeeping |
|  | Explosion | Think about possible over pressure during sealing treatment  Assure H2 gas cylinder have at least 30 bar when starting up experiment |