

Vapor Silanation Rig Safe Operating Procedures

7/5/22 Haley Holcomb

Location

The vapor silanation rig is located in the first fume hood you see to your left when you walk in the door of the microfluidics lab, Elings 3430.

Safety

Trimethylchlorosilane is flammable, toxic, and reacts with water vapor. It can make you sick if inhaled and ignite if it reacts with air or water vapor. It may only be used in the vapor silanation rig inside of a fume hood. Do not let the pressure inside the chamber exceed 15 in Hg. The silane valve must always be opened in a nitrogen atmosphere. Protective eyewear, a lab coat, and gloves must be worn. Make sure the fume hood is closed when you are not working inside of it. Do not handle the silane without consulting the MSDS.

Trimethylchlorosilane

Synonyms:

- TMCS
- Trimethylchlorosilane
- Trimethylsilyl chloride

Formula: $\text{C}_3\text{H}_9\text{ClSi}$ Molecular weight: 108.64 g/mol CAS-No.: 75-77-4 EC-No.: 200-900-5

This protocol is intended for gas-phase monolayer deposition of a silane to serve as a counter-adhesion agent for glass or silicon substrates. The chemical trimethylchlorosilane will be referred to as silane for the purposes of this protocol. It can be deposited onto silicon and glass substrates and etch metal oxides (e.g. alumina).

Operating Guidelines

1. Add yourself to the Silane Vapor Deposition Rig Log
2. Place your wafer inside the chamber. Check the O-ring seal. If dirty, wipe with a Kimwipe.
3. Turn the vacuum on with the green switch. When the pressure reads about 15 inHg, turn the vacuum off and test the vacuum by waiting a minute or two and making sure the pressure reading stays steady.

4. Turn the nitrogen on on the side of the fume hood. You only need to turn the knob once or twice.
5. Purge the chamber of water and air. Open the nitrogen valve until the pressure reads about 5 inHg, then open the vacuum valve until the pressure reads 15 in Hg again, repeating five times.
6. Open the two silane valves
7. Flip the sign to "IN USE".
8. Close the fume hood and set a timer for 40 minutes.
9. Update the logbook with your end time.
10. When your timer goes off, open the nitrogen valve until the pressure reads 5 in Hg. Open the vacuum valve until 15 in Hg. Repeat 5 times to purge the chamber again.
11. Close the silane valves (perpendicular).
12. Remove your wafer.
13. Flip the sign back to "AVAILABLE" and close the hood.

References

- [changing_silane_container_sop.pdf](#)
 - [tmcs_msds.pdf](#)
- [vapor_silanation_rig_sop_2_.pdf](#)

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<https://microfluidics.cnsi.ucsb.edu/wiki/> - Innovation Workshop Wiki

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