

NATIONAL UNIVERSITY OF SINGAPORE

Experiment-Based Risk Assessment Form			
Name of Department	Chemistry	Location of Lab	S9 #02-03
Name of Laboratory	CSMM3 Lab	Name of PI	Mark Breese
Name of Researcher/LO	Sara Azimi	Name of Activity/Experiment	usage of HF for electrochemical etching

No	Description/Details of Steps in Activity	Hazards	Possible Accident / Ill Health & Persons-at-Risk	Existing Risk Control (Mitigation)	Severity	Likelihood (Probability)	Risk Level	Additional Risk Control	Person Responsible	By (Date)
1	1. Electrochemical anodization of silicon wafers using d.c. currents of about 100 mA.	incorrect mounting of anodisation cell. Possible leakages from anodisation cell.	Exposure to HF vaours and contact with liquids	Before starting, ensure laboratory has the following: - For skin contact a tube of 2.5% calcium gluconate gel present within the laboratory. - For eye contact a sterile solution of 1% calcium gluconate. - Make sure the access to the emergency shower and eyewash is unobstructed. - Ensure that a small supply of appropriate neutralizer for spills should be kept near the fume hood where the work will be conducted. - Ensure that a spill kit is available. - Post a sign to alert people that work with HF is in progress. - All laboratory personnel working in the area must be informed of the special hazards involving the use of concentrated HF and know where the calcium gluconate gel is located.	2	2	4	Always work with a colleague	Sara Azimi	
2	2. Decant small volume (about 10 cc) of diluted HF into teflon beaker			1. Wear suitable PPE, eyewear and thick Neoprene or Nitrile gloves or other HF-resistant gloves.			0			
3	3. Load wafer into anodization cell and pour in HF, to cover wafer and platinum electrodes			acid resistant suit or apron. Wear a long-sleeved, buttoned lab coat, trousers and closed-toe shoes.			0			
4	4. Connect electrodes to power supply, check connections and switch on			2. Open and decant HF in fumehood. Return HF supply to locked cupboard prior to commencing work.			0			
5	5. Anodise for several minutes, either under manual or computer control			3. Ensure fumehood is on and with the sash as low as possible			0			
6	6. After anodisation, demount wafer, clean thoroughly, return dilute HF to main supply.						0			
7	7. Store all equipment in cupboard			Do not etch at high currents for extended periods (prevent excessive wafer heating)			0			
8				Use a series resistor to limit current flow. Use pre-set current limit on power supply.			0			
9				Ensure cables and platinum electrodes are electrically isolated and stored in a safe place.			0			
10				Do not allow HF solution to warm up (prevent excessive vapour). No naked flames Use only small volumes of dilute HF (approximately 10 ml)			0			

Conducted By Sara Azimi

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Do not leave etching work unattended  
 Always carry calcium gluconate antidote

Name: Mark Breese  
 \_\_\_\_\_  
 Signature

Approval date \_\_\_\_\_

Next Revision date  
 (Maximum 3 years)