Microsensors, Implantable Devices and Rodent Surgeries for Biomedical Applications
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Welcome to this lab. In this lab, we will see how the wet etching system works. So, wet etching is done in the hood, we have an acid bench, and we have a solvent bench. Now here we will take an example of gold and how can you etch the gold. So, when you deposit this gold using one of the techniques either it is thermal evaporation or it is E beam or it is sputtering and you want to dip this gold wafer into the chemical which is your potassium iodide right then what will happen is the gold will start etching. Now when your gold gets etched you have to rinse the wafer with DI water followed by drying the wafer.

It is as simple. So, it is a very small lab demonstration of how the gold etching works. I hope you like the video and you learn something while we are showing you the demo of wet etching. Ok, now we have seen the lithography process and it will be followed by the etching of the underneath layer.

So, till now what we have seen is on a substrate we deposited titanium as the etch layer followed by gold and then we coated it with a positive photoresist and we patterned it using a mask. We also after patterning, we developed it. So, now what we have is on a gold surface on a surface film of gold we have a patterned photoresist. Now we will be etching out this gold and the solution we will be using is potassium iodide and iodide solution which will etch out the gold that is not protected by the patterned photoresist. So, because we are dealing with chemicals and this is a chemical wet bench we do need to wear some personal protective equipment that is the PPE.

So, right now what I am having is I am having a splash goble an extra set of gloves and an apron. On top of that, I will be also wearing a face sheet along with the splash goblets and the other PPEs. So, now let us get started with the process. So, before starting the first step is to ensure that you have all the chemicals and glassware as well as the tweezers that you will be needing. So, I have my sample which is dipped in DI water one beaker and one petri dish.

I will be pouring my gold etchant like I said it is a potassium iodide and iodine solution just enough so that my sample is completely submerged. I will keep it aside. I will take my sample carefully dip it in the etchant and start shaking it. Now, I can see that some

patterns are developing which is an indication that my gold etchant is doing its work. I can take it out and observe that it needs more etching.

So, now you can see some patterns. I will just wash it in DI water again and you can see the solution. The DI water has turned slightly yellow which is the residual gold that was taken on the sample. Now, we will wash the sample. Remove this aside and wash it with DI water.

You can see that there is some gold pattern and some underlying titanium which we used as the adhesion layer. So, now I will dry it with a stream of nitrogen and then we can use it for our next process. So, now we are done with the gold etching. This is an example of what the end-to-end process starting from thin-pin deposition to lithography and etching looks like. So, using a combination of such series of steps that is deposition, litho and etching, we can create many complicated structures for our devices.

So, thank you.