Advanced Neural Science for Engineers
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Lecture 18
Lab 06 Liftoff Demonstration

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So, in the previous process we have seen lithography then followed by metal deposition. Now, we are going to do the final step for getting the devices that we need or the electrodes that we need, which is the liftoff process. So, we have the wafer which we have already seen, where the metal was deposited after the lithography step.

Now, we will dip this wafer in acetone. So, acetone is the solution that we use for lifting of process. So, acetone can strip photoresist or remove photoresist and when it removes photoresist it will take with it the metal that is deposited over the photoresist so, wherever gaps were there, that is wherever there was no photoresist and then the metal got deposited that will remain in that while taking out the metal which is deposited around the photoresist.

So, once we dip it in acetone, we wait for close to 10 to 15 minutes, so that acetone removes the photoresist then we follow that process with by dipping the wafer again in IPA or isopropyl alcohol. So, this is to remove acetone from the wafer surface and from IPA we will move it to

DA water which will remove the IPA as well from the wafer and then we will have the clean device so we will see the process now.

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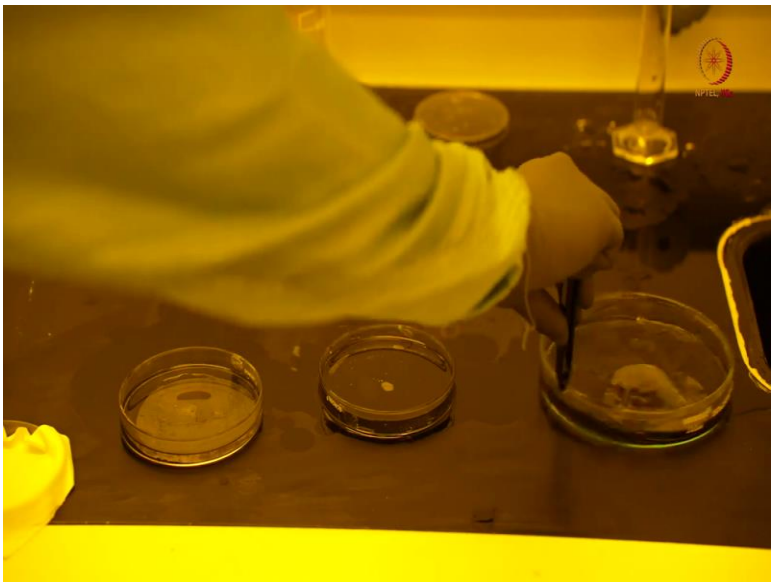

So, I am now adding acetone to one of the petri dish and when we can take the sample and keep it in acetone close to 10 to 15 minutes. Now, the acetone will slowly start removing the photoresist so meanwhile we can also add IPA for the next process. So, IPA is used for removing the acetone residues so now you can see the wafer in acetone if you clearly notice there are a lot of projections that you can see which is because the acetone is stripping the photoresist now, eventually the affordable cysts will start peeling off see you can see the photoresist peeling off from the side so this is called the liftoff process where the photoresist is lifts off.

See, you can see the photoresist is getting removed from the sides only leaving the pattern that we need intact so, as you can see most of the patterns photoresist from most of the area has already gone and you can see only the devices are remaining then we shifted to IPA and some IPA solution, we will shift it next to the DA water that we have here so now we have the liftoff process complete. Now, we can see closely how the wafer looks like.

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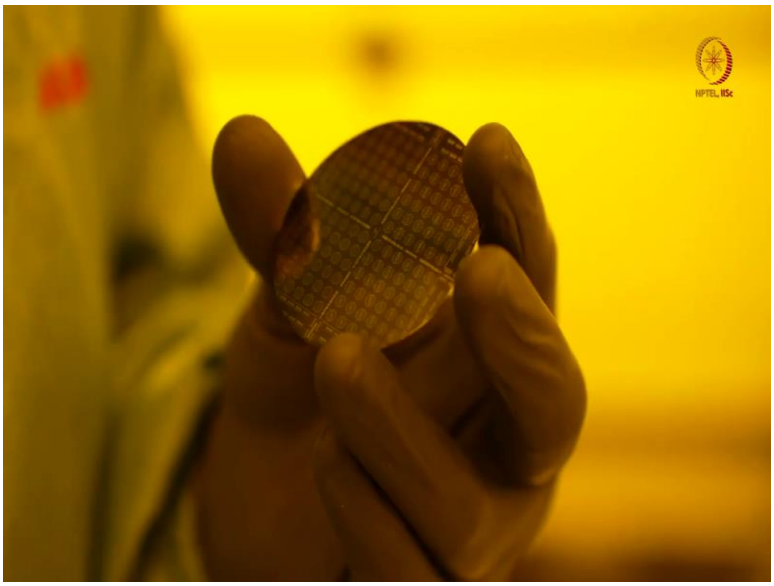

So, now we have the device ready after liftoff, you can see different patterns beautifully, you know they have come, so the liftoff process is complete. So, it is up to us to design the process flow that we need, maybe we can go for a lift off I mean lithography for bare metal the person and lift off to get the pattern or we could also go for metal deposition first followed by lithography and then itching.

So, we can design our process some processes are compatible for some specific applications. And yeah, so that is about the device that we have shown here. Now, we will keep it safely somewhere. So, I believe that you guys now understand how the device fabrication happens for neural applications. We can fabricate any type of design that we need.

With enough thought process we will be able to design the process flow accordingly and we can fabricate it as well. So, I hope you understood and found the session informative. we will see in another lecture. Thank you.