**DEVELOPMENT OF POLYDIMETHYLSILOXANE (PDMS) STRUCTURES**

***Version 1.0***

**Produced by: Natalia López Barbosa**

# OBJECTIVE

To develop Polydimethylsiloxane (PDMS) structures from a glass mold.

# REQUIREMENTS

To follow this tutorial, it is necessary to have training in: weighing on a precision balance, use of the desiccator, and sample heating on a hotplate.

# SOFTWARE REQUIREMENTS

None.

# STEP BY STEP

## MIXTURE PREPARATION

1. Use a glass container for sample preparation. It is recommended to use a Petri dish instead of a beaker.
2. In a 10:1 mass ratio, place Sylgard® 184 Silicone Elastomer Base and Sylgard® 184 Silicone Elastomer Cure (shown in Figure 1) inside the Petri dish.
3. Stir the mixture uniformly for five minutes or until it is full of bubbles. Pay attention to the mixture at the edges of the container.



Figure 1: Reactants for the fabrication of PDMS.

### Use of the desiccator



Figure 2: Polycarbonate Desiccator with Valve at the Inlet.

1. Place the Petri dish inside the desiccator shown in Figure 2. It is recommended to put a little absorbent paper under the Petri dish if it is very full.
2. Connect the desiccator to the vacuum valve through the valve indicated in Figure 2.

Note that if the valve is in a vertical position, it is closed, while if it is in a horizontal position, it is open.

1. Open the vacuum valve.
2. Observe how the bubbles rise to the surface of the mixture and form a layer that visually resembles foam.
3. Close the vacuum control valve so that air enters the desiccator. The bubbles on the surface should disappear almost completely.
4. Open the valve again to generate a vacuum inside the desiccator.
5. Repeat steps 3-5 on this list until no bubbles remain on the surface of the mixture.
6. Remove the mixture from the desiccator. Remember to close the vacuum valve after finishing using the desiccator.
7. Curing of PDMS, pour the mixture into a previously prepared glass mold containing the desired final shape.
8. Place the mold on a hotplate and heat it to 80°C for 30 minutes or until the PDMS solidifies.
9. Turn off the hotplate and wait for the mold to cool before removing it. Carefully remove the PDMS from the mold, taking care not to tear the final product.

# CHANGE CONTROL

|  |  |  |  |
| --- | --- | --- | --- |
| **CHANGE DESCRIPTION** | **DATE** | **VERSION** | **APPROVED BY** |
|  |  |  |  |