

## 1. INTRODUCTION

### **Background:**

The microelectronics industry over the past 50 years, MEMS have attracted considerable interest worldwide, which has led to rapid developments especially over the past decade. Microelectromechanical Systems (MEMS) have become an important area of technology combining material, mechanical, electrical, chemical, optical and fluids engineering disciplines. MEMS is the technology of very small devices, and they generally range size 20 micrometers to a millimeter. Because of its size, MEMS devices are manufactured using different microfabrication techniques such as bulk micromachining, surface micromachining. During those techniques basic MEMS process are used. Those process are deposition, patterning and etching. In etching, the material is dissolved when immersed in a chemical solution. In the latter, the material is sputtered or dissolved using reactive ions or a vapor phase etchant. Basically two types etching are there, which are dry and wet etching. What is more important and appropriate for our report is wet etching. Material for MEMS is not wide range. The primary material used in MEMS remains Si. Although Si MEMS can draw upon microfabrication techniques ready established in the microelectronics industry, due to its material properties, it is not suitable for MEMS operating in severe conditions. However, Silicon Carbide (SiC) has been recognised as an excellent candidate for applications which are operate in harsh environments due to its unique properties.

**Problem or purpose :** Objective of my report is to give detailed information about process of electrochemical etching of SiC. So far, no wet etchants are known that ability to etch SiC at room temperature. However, a feasible way to etch SiC at room temperature is electrochemical etching.

**Significance :** Up to that experiment, no one has demonstrated deep etching of SiC with electrochemical method. Due to that, my engineer friends will easily decide which material is more efficient and which etching type is more appropriate to manufacture new electronics devices.

**Scope and Organization :** In that report, materials Si and SiC's properties will be detailed and importance of SiC will be pointed out, after that part etching types Dry Etching, Wet Etching (Photoelectrochemical Etching, Chemical Etching, Electrochemical Etching) will be explained and focused on electrochemical etching importance for etching of SiC at room temperature, in next part electrochemical etching of SiC process will be explained briefly, in the last part of the report important points are highlighted and results will be discussed.

**Source and methods :** During that report I will use some critical articles which are really beneficial for electrochemical etching experiment.

**Summary :** To etch SiC at room temperature is electrochemical etching which is really convenient method to etch material when we compare them with other etching types.