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Reactive ion etching of 4H-SiC using SF6/O2 for MEMS application

ABSTRACT

Deep Reactive Ion Etching (DRIE) of 4H-SiC performed using SF6/O2 plasma. The etching rates investigated as a function of the ratio of the O2 flow rate to total gas flow rate under different etching conditions such as the effect of power density, temperature, and the combination of chemistries on etching. The investigation was proven that the contribution and effect of the direct role of Oxygen to deep etching of SiC. An optimum value of O2 fraction of 60% to 40% Sulfur Hexafluoride (SF6) used to give high etching rate of 1.2µm/min. for maximum etching.

Keyword: Deep Reactive Ion Etching (DRIE); Sulfur hexafluoride (SF6); 4H-SiC; Plasma