

ABSTRACT

ATOMIC LAYER ETCHING OF GaN AND OTHER III-V MATERIALS

Provided herein are ALE methods of removing III-V materials such as gallium nitride (GaN) and related apparatus. In some embodiments, the methods involve exposing the III-V material to a chlorine-containing plasma without biasing the substrate to form a modified III-V surface layer; and applying a bias voltage to the substrate while exposing the modified III-V surface layer to a plasma to thereby remove the modified III-V surface layer. The disclosed methods are suitable for a wide range of applications, including etching processes for trenches and holes, fabrication of HEMTs, fabrication of LEDs, and improved selectivity in etching processes.

FIG. 1C