



PERGAMON

Materials Science in Semiconductor Processing 2 (1999) 349–357

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MATERIALS  
SCIENCE IN  
SEMICONDUCTOR  
PROCESSING

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# Surface roughening of SiC and Ga-containing semiconductors in reactive plasmas

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## Abstract

Roughening of SiC and the Ga-containing semiconductors GaN, GaP, and GaAs is investigated in high-frequency reactive plasmas: in capacitively-coupled discharges at 13.56 MHz in a parallel-plate reactor and in plasmas driven by electron cyclotron resonance at 2.45 GHz. Objects to be roughened are rectangular slabs. With these devices, not only the surface which is directed rectangular to the electric field of the plasma sheath can be roughened but also the faces parallel to this field. As expected by high etch rates which exceed values obtained in argon by more than a factor of 20, processes in chlorine-containing plasmas are chemically dominated which causes partly crystallographic etching. The efficiency of the roughening process is demonstrated with high brightness GaN/InGaN LEDs on a transparent SiC substrate. © 2000 Elsevier Science Ltd. All rights reserved.

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