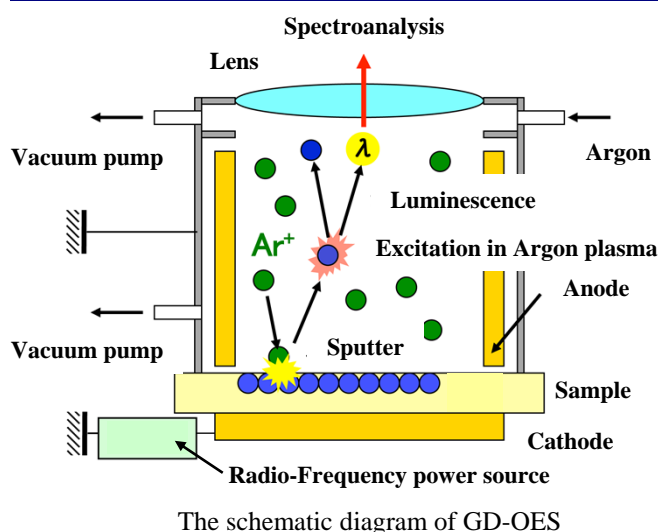


Characterization of SiO₂/SiC Interface in SiO₂ Films on 4H-SiC Substrate by GD-OES

GD-OES (Glow Discharge Optical Emission Spectroscopy) provides fast, simultaneous analysis of all elements of interest including the gases such as nitrogen, oxygen, hydrogen and chlorine, and is a useful tool to investigate from the surface down to more than 150 microns with a depth resolution that can be as good as 1 nm. Furthermore, it is suitable for the interfacial surface analysis, because GD-OES has a lower matrix effect than Dynamic-SIMS (Secondary Ion Mass Spectrometry). Here, we show an example of the depth profiling of several elements in the SiO₂ / SiC interface by GD-OES.

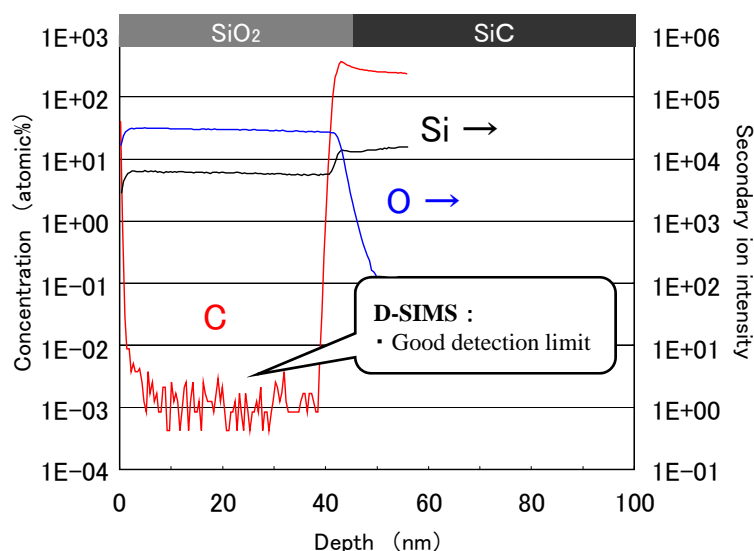
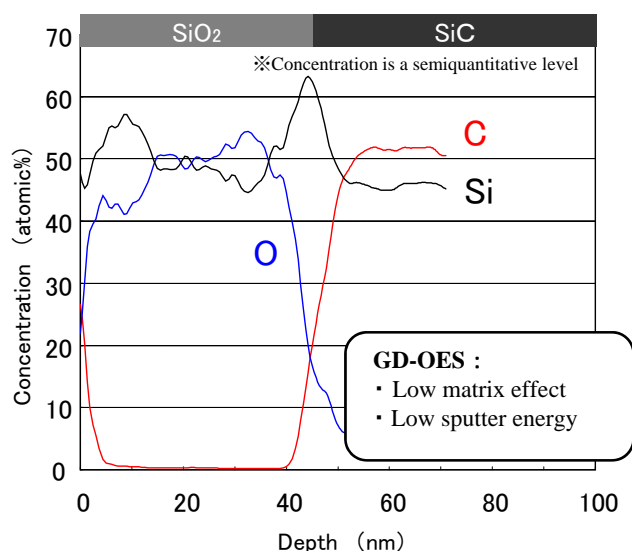
1. The principle and characteristics of GD-OES



Characteristics of GD-OES and Dynamic-SIMS (D-SIMS)

	GD-OES	D-SIMS
Sputter source	Plasma	Ion beam
Spatial resolution	△	○
Matrix effect	Low	High
Sputter energy	about 50 eV	about 100 eV ~
Depth resolution	◎	○
Range of Concentration	from tens of ppm up to 100 at%	from tens of ppt up to several at%
Lower detection limit	○	◎

2. Depth Profiling of several elements in SiO₂/SiC interface



GD-OES is an effective tool for the interfacial surface analysis because of its low matrix effect and low sputter energy, compared with D-SIMS. On the other hand, D-SIMS is the most sensitive technique for the elemental analysis in the thin films.

