

Development of a large-area atmospheric-pressure plasma CVD system 大面積大気圧プラズマCVDシステムの開発

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Here, we describe the novel technology for the fabrication of microwave-excited plasma (MWP) sources using microstrip line instead of conventional lumped-waveguide. A widely-blowing MWP has been generated using the technology and has been applied to the development of a large-area atmospheric-pressure plasma CVD system.

Carbon nanomaterials including graphene and nanocrystalline diamond films are expected to play a core role in 21st century industries. For the achievement of their practical utilization and industrialization, the development of innovative manufacturing processes is strongly required. Among various plasma sources, MWPs have been widely used for CVD of carbon materials because they allow relatively high density reactive radicals and low temperature plasmas over a wide range of gas pressures from low pressure to atmospheric pressure. In this work, we have developed manufacturing technology for MWP sources using microstrip line, which can overcome the limitation arisen from the use of lumped waveguide in MWP sources. Widely-blowing MWPs are stably

produced even atmospheric pressure. Experimental studies have been carried out to investigate their discharge characteristics for the application to a large-area atmospheric-pressure CVD system for the synthesis of carbon nanomaterials. In the conference, our plasma technology will be presented with our recent experimental results.

Acknowledgments

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References

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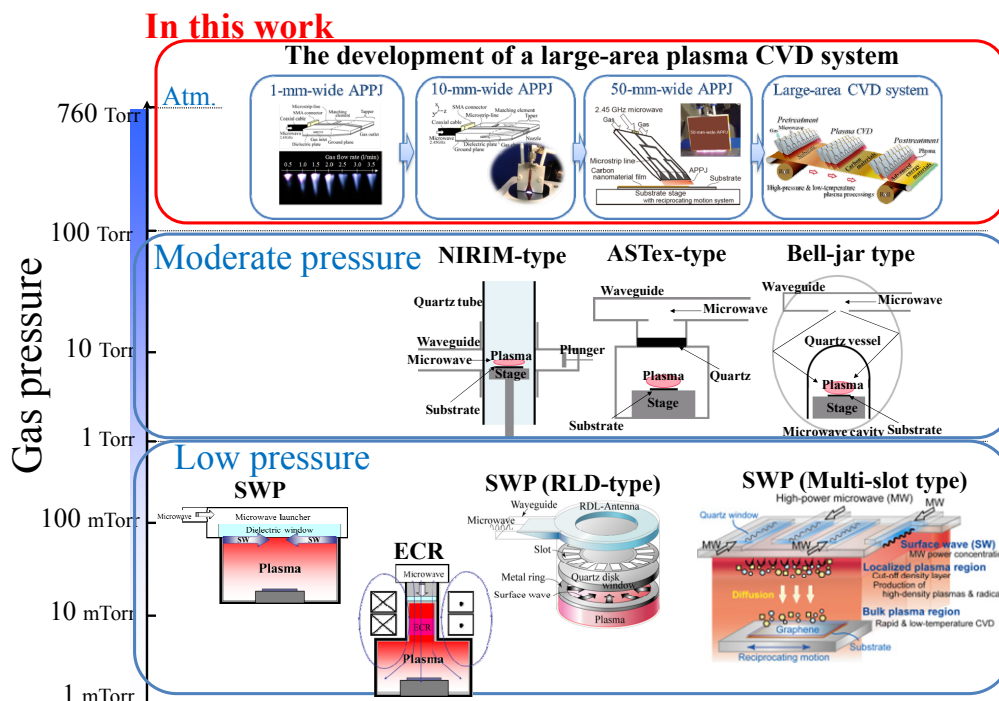


Figure.1 Conventional microwave plasma CVDs and our blowing-type plasma CVD system.