Abstract Submitted
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Self-assembled Ag nano-patterns forming in downflow of ammonia-Ar atmospheric pressure microplasmas NAOYA KIHARA, ELLA BLANQUET, OSAMU SAKAI, Kyoto University — Fractal-like Ag nano-patterns were observed after drying silver nitrate solution in downflow of ammonia-Ar atmospheric pressure microplasmas. These atmospheric-pressure microplasmas generated hydrazine, and this hydrazine density in their downflow region was in the order of 10^{15} cm^{-3} [1]. As hydrazine is a very strong reducing agent, Ag nano-particles were extracted from the silver nitrate solution. The Ag nano-structures were fractal-like patterns, with fractal dimension range of 1.6-1.9. The network structures in these patterns with several mm diameter showed good electric conductivity and extraordinary optical responses, which will be favorable for future low-cost optical metamaterials.

[1] K. Urabe, Y. Hiraoka and O. Sakai, Plasma Sources Sci. Technol. 22, 032003 (2013).

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