# Microstructure formation by atmospheric pressure micro-plasma jet

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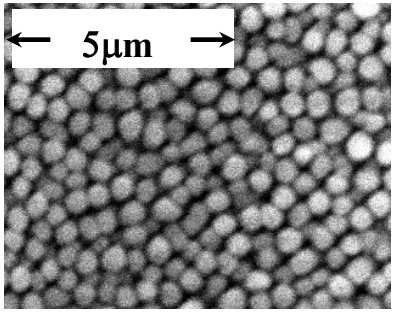


**Fig.1 $SiO_2$ particulate film**

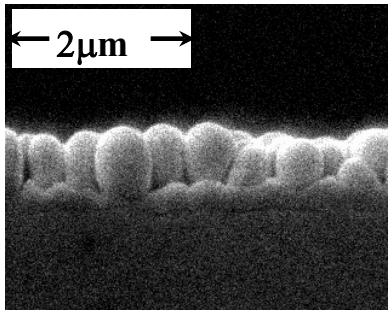


**Fig.2 Cross-section of the $SiO_2$ particulate film**

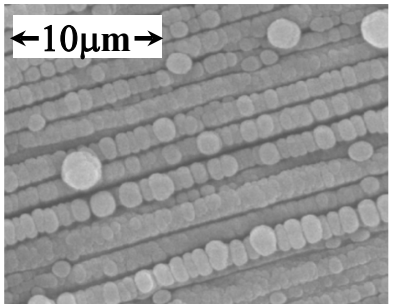


**Fig.3 Aligned $SiO_2$ particulate film**

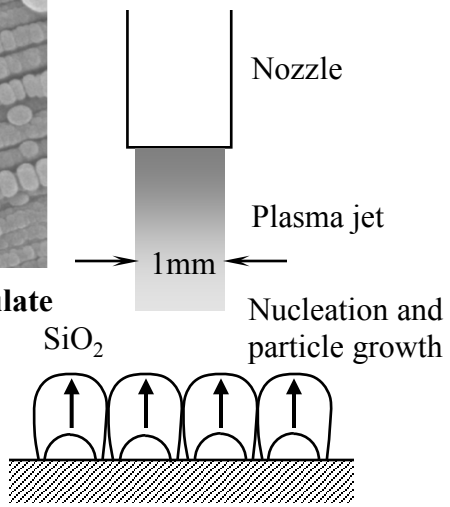


**Fig.4 Mechanism for particulate film formation**

Content:

We are studying the formation of microstructure on a substrate by using atmospheric pressure micro-plasma. Generally, plasma treatment has been carried out in vacuum, which lowers the easiness of handling of the process. However, the atmospheric pressure plasma system does not require an expensive vacuum system. The system has an advantages of lower equipment cost and easy manipulation of plasma.

We use both thermal and non-thermal plasmas as the atmospheric pressure micro-plasma jet. Fig.1 shows a SEM image of $SiO_2$ particulate film formed by decomposition of an organic silicon compound by atmospheric pressure thermal micro-plasma jet. The film is constructed by single layer of spherical particles, as shown in Fig.2. We can fabricate also a $SiO_2$ particulate film in which particles are aligned, as shown in Fig.3.

The atmospheric pressure non-thermal plasma jet is effective for formation of organic thin films. We fabricated an organic solvent-proof thin organic film by using the atmospheric pressure non-thermal micro plasma.

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