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PECVD of SiOC Films Using a Sheet-type Atmospheric Pressure Plasma Jet KOUTA NAKAJIMA, KENJI TANAKA, TATSURU SHIRAFUJI, Osaka City University — Packaging industries have used SiOC thin films for gas barrier coatings on the membranes for packaging foods, drug, and so on. PECVD is the most extensively employed method for preparing the SiOC films. However, PECVD is a process performed at a low pressure in general and requires expensive vacuum systems, especially in the case of large area coatings. Atmospheric pressure PECVD is a candidate to overcome this issue. If we simply apply atmospheric pressure plasma to CVD processes, however, we will encounter the problem of particle formation because of the high collision frequency in the environment of atmospheric pressure. In this work, we have developed a reactor that utilizes a unique gas-flow scheme for avoiding the particle formation. We have successfully deposited SiOC films by using this reactor, in which the source material is hexamethyldisiloxane and discharge/carrier gas is He. XPS measurements on the SiOC films have revealed that the films contain relatively higher concentrations of unfavorable methyl groups that reduce gas barrier performances. However, no particulates are involved in and on the deposited films as long as characterizing the films with eye observation and with transmission electron microscopy.

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