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**Development of Pressure Sensitive Molecular Film for Micro Devices** YU MATSUDA, HIDEO MORI, TOMOHIDE NIIMI, HIROYUKI UENISHI, MADOKA HIRAKO, Nagoya University — The pressure-sensitive paint (PSP) has potential as a diagnostic tool for pressure measurement in the high Knudsen number regime because it works as a so-called “molecular sensor.” However, application of the PSP to micro devices has never been reported because the conventional PSP is too thick owing to the use of polymer binder. In this study, we have adopted Langmuir-Blodgett (LB) technique to fabricate pressure sensitive molecular films (PSMFs) using Pd(II) Octaethylporphine (PdOEP) and Pd(II) Mesoporphyrin IX (PdMP), and have tested these PSMFs to evaluate the feasibility of the pressure measurement around the micro devices. It is clarified that the PSMF composed of PdMP has higher sensitivity than that of PdOEP. Since it is also considered that the sensitivity of PSMFs can be increased by introducing arachidic acid as the spacer molecules to prevent the aggregation of luminescent molecules, we have produced PSMFs with several molar ratio of PdMP to arachidic acid. At the most suitable ratio, the PSMF has sufficient sensitivity in the low pressure region with high Knudsen number, even if the amount of the luminescent molecules in the PSMF layer is smaller than that in conventional PSPs. This indicates that the PSMF is feasible to measure the pressure in high Knudsen number flows such as micro flows.

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