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**Synthesis of metal-organic framework films by pore diffusion method.** NAOHIRO MURAYAMA, YUKI NISHIMURA, Tottori Univ, HIROSHI KAJIRO, Nippon Steel Sumitomo Metal Co., SATORU KISHIDA, KENTARO KINOSHITA, Tottori Univ, TiFREC, TEDREC, TOTTORI UNIV TEAM, NIPPON STEEL SUMITOMO METAL CO. COLLABORATION, TOTTORI INTEGRATED FRONTIER RESEARCH CENTER (TiFREC) COLLABORATION, TOTTORI UNIVERSITY ELECTRONIC DISPLAY RESEARCH CENTER (TEDREC) COLLABORATION — Metal-organic frameworks (MOFs) presents high controllability in designing the nano-scale pore, and this enable molecular storages, catalysts, gas sensors, gas separation membranes, and electronic devices for next-generation. Therefore, a simple method for film synthesis of MOFs compared with conventional methods <sup>[1]</sup> is strongly required. In this paper, we provide pore diffusion method, in which a substrate containing constituent metals of MOF is inserted in solution that includes only linker molecules of MOF. As a result, 2D growth of MOF was effectively enhanced, and the formation of flat and dense MOF films was attained. The growth time,  $t$ , dependence of film thickness,  $d$ , can be expressed by the relation of  $d = A \ln(t+1) + B$ , where A and B are constants. It means that ionized coppers diffuse through the pores of MOFs and the synthesis reaction proceeds at the MOF/solvent interface. We demonstrated the fabrication of a HKUST-1/Cu-TPA hetero structure by synthesizing a Cu-TPA film continuously after the growth of a HKUST-1 film on the CuO<sub>x</sub> substrate. [1] Denise Zacher *et al.*, *Angew. Chem. Int. Ed.* **50**, 176 (2011).

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