## **Supporting Information**

## Adsorption properties of methane, ethane, and hexane on mesoporous organic polymers prepared by the flash freezing method

Ryoichi Koyama<sup>1</sup>, Fujika Tsunoda<sup>2</sup>, Izumi Ichinose<sup>\*2</sup> and Hirofumi Kanoh<sup>\*3</sup>

<sup>1</sup>Graduate School of Science and Engineering, Chiba University, 1–33 Yayoi-cho, Inage, Chiba 263–8522, Japan; <sup>2</sup>Research Center for Functional Materials, National Institute for Materials Science (NIMS), 1–1 Namiki, Tsukuba 305–0044, Japan; <sup>3</sup>Graduate School of Science, Chiba University, 1–33 Yayoi-cho, Inage, Chiba 263–8522, Japan

\* Corresponding Authors:

e-mail: ICHINOSE.Izumi@nims.go.jp; kanoh@faculty.chiba-u.jp

## ORCID

Izumi Ichinose: 0000-0002-2236-0942

Hirofumi Kanoh: 0000-0003-1696-5432



Figure S1. The same data as in Figure 5 are expressed using the absolute pressure for the x axis. Adsorption isotherms of  $C_2H_6(\bullet)$ ,  $C_3H_8(\blacktriangle)$ ,  $C_6H_{14}(\blacksquare)$ , and  $H_2O(\bullet)$  on mesoporous PVC at 283 K.



Figure S2. N₂ adsorption isotherms of AC (●, ○) at 77 K. a) linear scale, b) logarithmic scale for x axis. Filled symbol: adsorption, open symbol: desorption



Figure S3. Pore size distribution of AC derived from the N<sub>2</sub> adsorption isotherm at 77 K by using the Horvath–Kawazoe method



Figure S4. The same data as in Figure 8 are expressed using the absolute pressure for the x axis. Adsorption isotherms of C<sub>6</sub>H<sub>14</sub> (●) and H<sub>2</sub>O (■) on mesoporous PVC (left) and adsorption isotherms of C<sub>6</sub>H<sub>14</sub> (▲) and H<sub>2</sub>O (◆) on AC (right)