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Electronic Supplementary Information (ESI)

Dynamics of a bioinert polymer in hydrated states by dielectric relaxation spectroscopy

Toyoaki Hirata,[a] Hisao Matsuno,*[ab] Daisuke Kawaguchi,[c] Manabu Inutsuka,[a] Tomoyasu Hirai,[a]

Masaru Tanaka[d] and Keiji Tanaka*[ab]

[a] *Department of Applied Chemistry, Kyushu University, Fukuoka 819-0395, Japan*
[b] *International Institute for Carbon-Neutral Energy Research (WPI-I2CNER), Kyushu University, Fukuoka 819-0395, Japan*
[c] *Education Center for Global Leaders in Molecular Systems for Devices, Kyushu University, Fukuoka 819-0395, Japan*
[d] *Institute for Materials Chemistry and Engineering, Kyushu University, Fukuoka 819-0395, Japan*

***Authors for correspondence:**

Hisao Matsuno
h-matsuno@cstf.kyushu-u.ac.jp
Keiji Tanaka
k-tanaka@cstf.kyushu-u.ac.jp

Thermogravimetry (TG) analyses. Fig. S1 shows typical TG thermograms of poly(2-methoxyethyl acrylate) (PMEA) with a number average molecular weight (M_n) of 23.5k hydrated under different conditions for 1 week. The weight loss depended on the relative humidity (RH) of atmospheres in which the samples were placed before TG measurements. The water contents (W_w / wt%) in each sample are summarized in Table S1. In addition, the volume fractions of water (ϕ_w / vol%) calculated using the W_w values and density of PMEA and water are shown in Table S1.

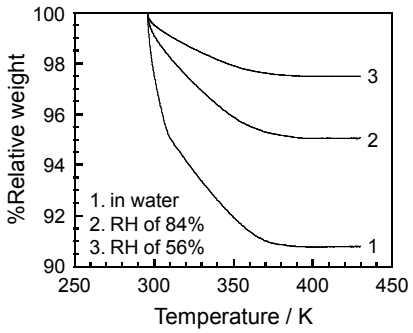

Fig. S1. Typical TG thermograms of PMEA-23.5k hydrated under different conditions. All thermograms were standardized in initial weight of each sample.

Table S1. The water contents (W_w) of PMEA hydrated at different atmospheres quantified by TG analyses and the estimated volume fraction of water (ϕ_w) in each PMEA sample.

Sample code	Atmosphere	W_w / wt%	ϕ_w / vol%
PMEA-23.5k	liquid water	9.2	11
PMEA-23.5k	RH of 84%	4.9	6.1
PMEA-23.5k	RH of 56%	2.5	3.1
PMEA-53.6k	liquid water	9.2	11
PMEA-104k	liquid water	9.1	11

Temperature dependence of dielectric loss. Fig. S2 shows the temperature dependence of dielectric loss (ε'') for PMEA-23.5k in a dried state. Two peaks were observed around 250 and 160 K for each curve, as marked by arrows. Since the temperature position for the ε'' peaks was dependent on frequency (f), it is clear that the two sets of peaks can be assigned to a release of molecular motions with a different size scale (α- and β-processes, respectively).

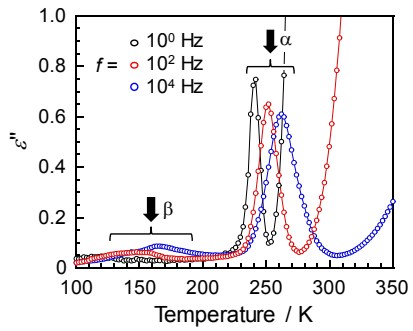

Fig. S2. (a) Temperature dependence of dielectric loss (ε'') for PMEA-23.5k in a dried state. Three data sets at 10^0, 10^2, and 10^4 Hz (black, red and blue) are presented.