Change in the Dehydrated-Gel SAXS-Profile with Additives

Kazuhiro Hara¹, Masaaki Sugiyama² and Masahiko Annaka³

¹Institute of Environmental Systems, Faculty of Engineering, Kyushu University,
6-10-1 Hakozaki, Higashi-ku, Fukuoka 812-8581, Japan
²Kyoto University Research Reactor Institute
Kumatori-cho Sennan-gun, Osaka 590-0494, Japan
³Department of Chemistry, Faculty of Sciences, Kyushu University
6-10-1 Hakozaki, Higashi-ku, Fukuoka 812-8581, Japan

Effect of Trehalose

In both of the industrial technology and fundamental science, nanoscale structures have attracted much attention. In these days, several methods are taken to materialize the nanostructure with the structural-scales needed. Among the self-organizing techniques, there are still many concrete creating methods; the authors have been much interested in one of these methods which make use of constituent compatibilities. The authors have adopted trehalose which is compatible with the solvent(water) in hydrogels and, recently, has attracted much attention with a functionality to protect cells against extreme conditions such as dehydration and freezing.

As shown in Fig.1 of the previous report (shown above), the authors have found an influence by introducing trehalose: In double legalism plot of SAXS profile, the dehydrated agarose gel without trehalose and with trehalose, respectively. The inset arrow indicates the lower limit of scale of fractal structure in the agarose gel with trehalose (previous report).

Fig.1. SAXS profiles of dehydrated agarose gel with and without trehalose. Closed circle and open circle indicate the profiles of the dehydrated agarose gel without trehalose and with trehalose, respectively. The inset arrow indicates the lower limit of scale of fractal structure in the agarose gel with trehalose (previous report).

Fig.2. The SAXS profiles of a dehydrated NIPA/SA (500mM/200mM) gel and of those dehydrated after absorbing Cu²⁺ ion. Numerals in a square at the upper-right corner are Cu²⁺ concentrations of aqueous solutions in which NIPA/SA gel lumps were immersed before dehydration.

* haratap@mbox.nc.kyushu-u.ac.jp