


実験報告書様式(一般利用課題・成果公開利用)

(※本報告書は英語で記述してください。ただし、産業利用課題として採択されている方は日本語で記述していただいても結構です。)

 Experimental Report	承認日 Date of Approval 2013/11/23 承認者 Approver Jun-ichi SUZUKI 提出日 Date of Report 2013/03/28
課題番号 Project No. 2012B0082 実験課題名 Title of experiment Micelle Structures of Gemini-type Amphiphilic Dendrimers using Small-Angle Neutron Scattering 実験責任者名 Name of principal investigator Tomokazu Yoshimura 所属 Affiliation Nara Women's University	装置責任者 Name of Instrument scientist J. Suzuki 装置名 Name of Instrument/(BL No.) TAIKAN / BL15 実施日 Date of Experiment 2012/12/08 9:00 ~ 2012/12/11 9:00

試料、実験方法、利用の結果得られた主なデータ、考察、結論等を、記述して下さい。(適宜、図表添付のこと)
 Please report your samples, experimental method and results, discussion and conclusions. Please add figures and tables for better explanation.

1. 試料 Name of sample(s) and chemical formula, or compositions including physical form.

A gemini-type amphiphilic dendrimer ($2C_{12}$ -2denGn), which consist of two poly (amidoamine) (PAMAM) dendrons (generation number of 1 – 5) and alkyl-chains (C_{12}) connected by spacer chains was successfully synthesized (shown in Figure 1). The $2C_{12}$ -2denGn were solubilized in Tris buffer (D_2O) at pH 2 – 11(2, 5, 7 9, and 11).

All sample concentrations were 3 mM. The solution was enclosed in quartz cells with a path length of 2 mm.

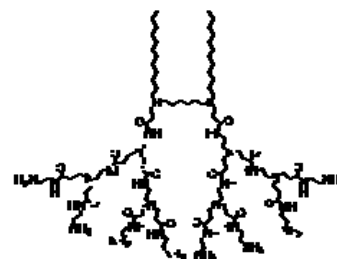


Figure 1 Chemical structure.

2. 実験方法及び結果 (実験がうまくいかなかった場合、その理由を記述してください。)

Experimental method and results. If you failed to conduct experiment as planned, please describe reasons.

SANS experiments were performed on a small-angle neutron scattering instrument (TAIKAN) installed at BL15 in the MLF Facility in J-PARC. The total covered Q range was $0.01 - 2.0 \text{ \AA}^{-1}$. All SANS measurements were performed at ambient temperature. The exposure time for each sample was 2.5 hours.

Figure 2 shows pH dependence of SANS profiles for $2C_{12}$ -2denG2 in an aqueous solution. The present SANS profiles were obtained by the small-angle detector bank at $L_2 = 5.56 \text{ m}$. According to SAXS measurements, with decreasing pH from 7 to 2, the SAXS profiles were drastically changed in low and high Q regions. On the other hand, the SANS profiles was changed in low Q region. We interpreted that the change of SAXS profile originated from a change in scattering contrast. We confirmed that the micellar structures of $2C_{12}$ -2denGn were maintained in the aqueous solution at low pH. In the SANS profiles, SANS intensities decreased with decreasing pH, which was attributed to the electrostatic repulsion between surface charges of the $2C_{12}$ -2denGn micelles. In order to determine the shape of these micelles quantitatively, a global SANS and

2. 実験方法及び結果(つづき) Experimental method and results (continued)

SAXS fitting analysis of both results for $2C_{12}$ -2denGn is now in progress.

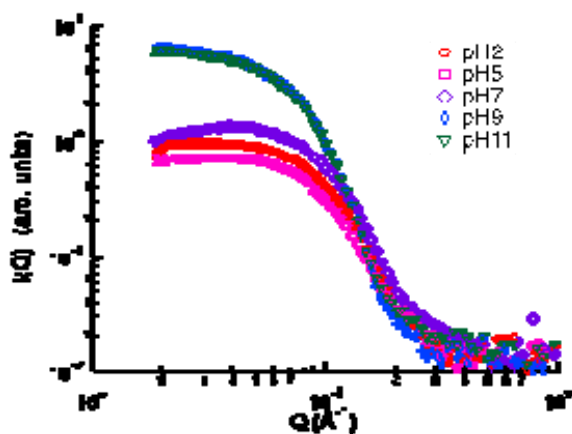


Figure 2. SANS profile for gemini-type amphiphilic dendrimer ($2C_{12}$ -2denG2) in aqueous solutions depending on pH ranged from 2 to 11.