



Zeta Potential Measurement of Ferritin

Outline

Ferritin is a protein which is abundant in various parts of the human body, including liver, spleen, bone marrow, and muscle; it is known as an iron-binding protein associated with the storage of iron ions (Fe^{3+}). When one suffers from anemia, a disease caused by iron failure in the body, ferritin levels first decrease followed by decreases in serum iron and hemoglobin levels. This protein is also a promising cancer marker. Among the device-fabrication processes which have recently become matters of concern is the fabrication process of novel nanostructures by bottom-up-type nanotechnology, known as a bio-nanoprocess, which involves the use of bio-mineralization the phenomenon of aggregation-based crystal growth of inorganic substances contained in nucleic acids and proteins.

This process utilizes the phenomenon of aggregation-based crystal growth of inorganic substances contained in ferritin and other bio-molecules (bio-mineralization)¹⁾.

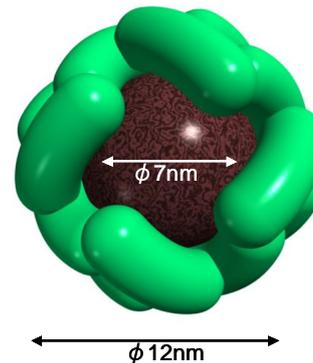


Fig. 1 Ferritin, a basket protein¹⁾

Source: Provided through the courtesy of Panasonic Corporation

Method

Analyzer: SZ-100
Measurement Temperature: 25.0 degree C
Sample: Ferritin

Disperse medium: Tris-Hcl buffer solution (approximately pH 7.8-8.8)
Refractive index of disperse medium: 1.333

Results

The measurement result of ferritin nanoparticles is shown in Fig. 2. The zeta potential of this sample was - 35.0 mV. There appears in the graph a measurement of the zeta potential of the sample in a Tris-Hcl buffer solution. *The ferritin measured in this experiment has nothing to do with the picture of Fig. 1.

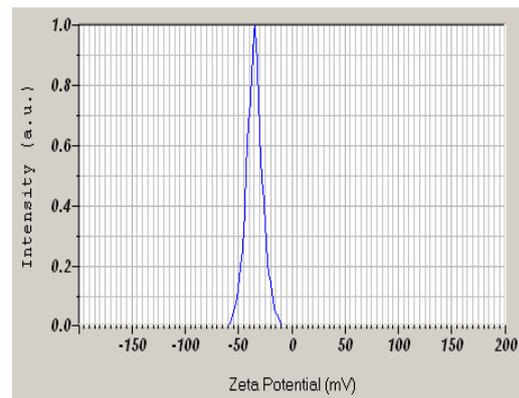


Fig. 2 Zeta potential of ferritin

Conclusion

Ferritin is known to exhibit higher thermal and pH stability than most other proteins and exist stably without showing any drastic change in property with changing pH. This stability can be confirmed using zeta potential.

* The information described here has no relevance to Panasonic Corporation.



Nano Particle Analyzer

Applications Data Sheet

ADS-SZ-ZE-012

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NANO PARTICLE ANALYZER
SZ-100

- 1) Panasonic Technical Journal Vol.54 No.3 2008

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