Conference Presentation

Nanoscale cluster structure of O₂ gas-filled nanobubbles in O₂ gas-supersaturated alkaline solution

Ichiro Otsuka

Department of Chemistry Ohu University, Japan
Email: tkikui@cocoa.ocn.ne.jp

Abstract

There exists a close parallelism between gas-filled nanobubble solutions and ultra-high dilutions. Both these solutions contain Brownian nano-sized bubbles. We have studied aggregation kinetics of O₂ gas-filled Brownian nanobubbles and their nanoscale cluster structure in 0.1M NaCO₃ with NanoSight Particle Tracking Analysis (NTA) and transmission electron microscopy (TEM). A number of discrete peaks in a NTA size distribution of O₂ nanobubbles in 0.1M NaCO₃ eight days later after production are closely related to the existence of stable nanobubble clusters composed of 6-9nm nanobubbles that are inferred from the internal void size observed with TEM. Recent reports on ¹H NMR of nanobubble water and its biological effects of wheat germination by Ohshita's group may correlate with Demangeat's NMR studies and germination experiments performed by many groups since the first publication by Lily Kolisko in 1923. Demangeat's has recently published a review on the essential role of succession that can cause nanobubble formation.¹

References

1. [Demangeata JL. Gas nanobubbles and aqueous nanostructures: the crucial role of dynamization. *Homeopathy* 2015; 104\(2\):101–15.](#)

Keywords: Di-oxygen gas filled nanobubble, nanoscale cluster structure, aggregation kinetics, high dilution

© International Journal of High Dilution Research.
Not for commercial purposes.

Cite as: Otsuka I. Nanoscale cluster structure of O₂ gas-filled nanobubbles in O₂ gas-supersaturated alkaline solution. Proceedings of the XXIX GIRI Meeting; 2015 June 3 – 5; Verona (Italy). *Int J High Dilution Res.* 2015; 14(2): 40-40