

Abstract Submitted
for the MAR11 Meeting of
The American Physical Society

Universal Patterns of Cluster Growth in Aqueous Sugars Observed by Dynamic Light Scattering¹ TRI TRAN, DAVID SIDEBOTTOM, Creighton University — Dynamic light scattering was performed on aqueous sugar solutions to monitor the growth of sugar clusters as a function of sugar concentration and temperature. Three sugars (glucose, maltose and sucrose) were investigated. Analysis of the hydrodynamic radius of the diffusing clusters suggests a two-stage process of cluster growth. At low volume fractions of sugar, a cluster phase consisting of nearly monodisperse clusters forms with a mean cluster mass that increases in proportion to the volume fraction. A second stage of growth develops when clusters reach a size where they begin to overlap. In this later stage, cluster-cluster aggregation occurs and the cluster size grows in a common, but temperature dependent, power law fashion in advance of a percolation threshold near 83 wt% sugar.

¹This work is supported by a grant from National Institute of Biomedical Imaging and Bioengineering (R01EB009644)

Tri Tran
Creighton University

Date submitted: 18 Nov 2010

Electronic form version 1.4