

Abstract Submitted
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Time-Dependent and Low Temperature Studies of Amyloidogenic and Non-amyloidogenic Proteins by Dielectric Relaxation Spectroscopy

DONALD BARRY, SHAUN MARSHALL, SHELBY HUNT, Worcester Polytechnic Institute, FLORIN DESPA, University of California, Davis, IZABELA STROE, Worcester Polytechnic Institute — We present dielectric relaxation spectroscopy measurements of amyloidogenic Abeta (1-42) and non-amyloidogenic Abeta (42-1) proteins over a frequency range of 10 mHz to 10 MHz. Measurements were performed as a function of time from 0 to 24 h and temperature range of 193K-283K. Two relaxation peaks, alpha and beta, were observed at temperatures above 193 K. These peaks are attributed to the bulk and bound water. As a function of time, the dielectric signal of the Abeta (1-42) shifts towards the dielectric signal of the solvent while for the Abeta (42-1) the dielectric signal does not change. The activation energies of Abeta (1-42) and Abeta (42-1) were calculated and significant differences were found. We attribute these variations to structural changes that affect the hydration map of Abeta (1-42) aggregates. Our results are in agreement with theoretical predictions.

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