

Preface

Low molecular weight and polymeric molecules can be constrained under the conditions of geometrical confinement having different dimensionalities:

- (i) in nanometer thin layers or self-supporting films (one-dimensional),
- (ii) in pores or tubes having nanometric diameter (two-dimensional), or
- (iii) as micelles embedded in a matrix (three-dimensional), or as nanodroplets.

Within the last two decades, their dynamics under such conditions has been the focus of intense worldwide research activities. Evidence exists that the overall molecular mobility results from a subtle balance between surface and confinement effects. Due to attractive guest/host interactions, the former causes a slowing down of the molecular dynamics, which can be compensated by an appropriate surface coating. The latter is characterized by an increase in the mobility, which becomes more pronounced with decreasing external length scale, e.g., film thickness or pore diameter. In this case, modification of the host/guest interaction by surface treatment has negligible or no effect. Broadband Dielectric Spectroscopy (BDS) plays an essential role in these studies. It is the intention of this second volume in the series “Advances in Dielectrics” to summarize the state of the art in this emerging field, which is also of fundamental importance for nanotechnology.

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