

CLUSTERING BEHAVIOUR OF END-GRAFTED POLYSTYRENE CHAINS WITH ZWITTERIONIC GROUPS: EFFECT OF MOLECULAR WEIGHT AND NUMBER OF END-GROUPS

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ABSTRACT

In this paper, we are investigating the clustering behavior of end-grafted polystyrene chains with zwitterionic end groups. Our model system offers a unique direct look to the case of clustering behavior upon the change of solvent conditions of semi-irreversibly end-grafted chains. We measured three different types of PS chains with different architecture: one, two and three end groups. We aimed to find whether these end groups are affecting the layer of the adsorbed polymeric layer as well as the distance between two anchoring points and thus the thickness of the adsorbed polymeric layer. We measured both dry and liquid phases. In liquid phase, we used measurements depicted from SFA technique while in the dry condition we used AFM measuring mainly the formed clusters after drying. AFM allows the direct observation of clustering behavior, while AFM images analysis allows the measurement of the statistical distributions and averages of the individual sizes (laterally and vertically with respect to the substrate surface) of the aggregates and their separation distances. The results are rationalised in terms of the competition between adsorption energy of end groups and clustering/aggregation behavior of chains and shows the same behavior either by SFA and AFM techniques, presenting neither significant increase in the adsorbed amount nor significant changes in the layer thickness.

KEYWORDS: *Clustering Behaviour, Semi-Irreversibly End-Grafted Chains*

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