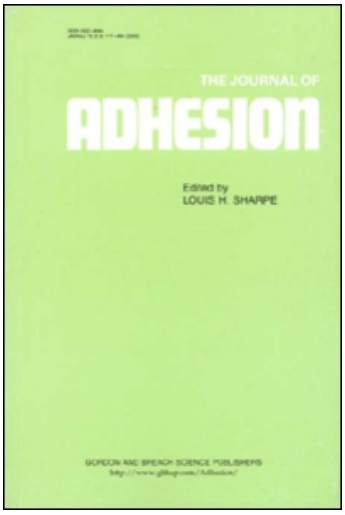

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BOOK REVIEW

Yu. S. Lipatov, "Fiziko-khimiya napolnennykh polimerov" ("Physical Chemistry of Filled Polymers"). Naukova Dumka Publ., Kiev 1967. 234 pp. Ruble 1.25.

As stated in the preface, the book is based on the experimental results obtained by the author and his collaborators since 1959. Their subject is the alterations in the configuration and the physical properties of a polymer caused by the vicinity of a foreign solid; thus, a plastic material which solidified at a wall of a mold may have a density, a dielectric constant, a glass transition temperature, etc. different from those of an identical polymer taken from the middle of a cast specimen. The effects presumably are important for the understanding of the overall properties of filled polymers, such as the glass-reinforced plastics. This complex of observations is ably discussed in Chapters III to VI of the monograph, whose titles are Relaxation Processes in Filled Polymers; Packing Density of Polymer Molecules in Filled Polymers; Effect of Fillers on the Phase and the Physical State of Polymers, and The Mechanism of the Reinforcing Action of Fillers in Polymers.

Chapters I and II are of a more direct interest to the readers of this magazine. Chapter II reviews the Adsorption of Polymers on Solid Surfaces and includes a section which discusses the correlation, if any, between this adsorption and adhesion. It is pointed out in this section, for instance, that glass adsorbs polystyrene more avidly than it does gelatin while "the adhesion to the glass surface" is greater for gelatin than for polystyrene. This is an example of confusion created, above all, by using the term *adhesion* in several different meanings. The breaking stress of glass—gelatin—glass joints usually is greater than that of similar glass—polystyrene—glass joints because of two reasons: (a) the hydrophilic gelatin is less likely to form a weak boundary layer along the interface with an insufficiently dried glass than the hydrophobic polystyrene, and (b) the proper joints containing gelatin generally are stronger than those containing polystyrene simply because the tensile strength of the former, as a rule, exceeds that of the latter. Obviously, neither of these reasons is related to the adsorption of the polymer by the glass. Thus there was no justification for expecting a similarity between the intensity of adsorption and the breaking stress of joints. To achieve a link between these quantities, the following (incorrect) reasoning would be required: (a) adhesion is the molecular attraction between, for instance, a glass and a polymer; hence, the adsorption of a polymer by a glass must be related to adhesion; (b) adhesion is the breaking stress of, e.g., glass—polymer—glass joints; and (c) hence, this breaking stress is related to adsorption.

Chapter I has the title "Adhesion of Polymers to Fillers" and the misleading use of the crucial word, exemplified in the preceding paragraph, unfortunately is noticeable also in this chapter which would have been the most valuable to adhesion specialists.

J. J. Bikerman