

## BOOK REVIEWS

**Batch Directory for Polymer-Use Chemicals**, J. T. Baker Co., Phillipsburg, N.J., 1966. Gratis. 20 pp.

The Directory is an attempt by one major supplier of laboratory chemicals to provide a comprehensive list of chemicals having demonstrated or potential applications in the polymer field. About two thousand compounds are listed both according to an easily mastered structural-atomic code (Batch number) and by use classes, such as antioxidants, curing agents, monomers, plasticizers, regulators. Various natural and synthetic polymers are also included.

Although the choice of compounds and the placement in a given use category are sometimes arbitrary, the Directory should facilitate the polymer chemist's task of finding laboratory chemicals.

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**Physical Chemistry of Filled Polymers.** (Russian). Yu. S. Lipatov. Naukova Dumka, Kiev, 1967. 233 pp. Rubles 1.25. (\$1.37).

In the last seven years, the author and his collaborators published many papers on the changes produced in a polymer by its contact with another solid; an English summary of this work appeared in *Trans. J. Plastics Institute (London)* in April 1966. Now the author's findings are presented in the framework of a wider discussion. The six chapters deal with adhesion of polymer to fillers, adsorption of polymers on solid surfaces, relaxation processes in filled polymers, packing density of polymer molecules in filled polymers, effect of fillers on the phase and physical states of the polymers, and the mechanism of the reinforcing action of fillers in polymers.

The first two chapters (the first half of the book) obviously are of a lesser interest to the author than the rest, and in many instances the author treads with caution. For instance, there is a description of some experiments showing that no chemical bond between the glass fiber and the "finish" or the "finish" and the matrix is needed, but the obvious general conclusion concerning the causes of strength of reinforced plastics is not made.

The next three chapters report mainly on the author's experimental work and constitute, in the reviewer's opinion, the most valuable part of the book. The glass transition temperature and the degree of swelling of a polystyrene and a poly(methyl methacrylate) are raised by incorporating glass filaments or quartz powder in the polymer. Fillers lower the dielectric loss and sometimes shift its maximum to lower temperatures. The rate of isothermal contraction (after a sudden cooling of the sample) is smaller the greater the filler content.

These and many related observations are discussed immediately after the description of the experiments and again in the concluding chapter. The author does not believe

that the frozen stresses in the filled polymer are the main cause of the effects observed; he pays more attention to the loss of mobility caused by anchoring the chains at the filler surface, to the lower density of the interfacial polymer strata, and similar phenomena. So far, the explanations are mainly qualitative.

For the benefit of those who, ignorant of the language, would not spend \$1.37 for this monograph, at least its chapters III-V should be made available in an English translation.

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