ELASTOMERS AND PLASTOMERS

Edited by

R. HOUWINK

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CONTENTS

CHAPTER 1.

PHENOL-FORMALDEHYDE PLASTOMERS

by

DR. R. HOUWINK

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§ 1. Introduction.

In this chapter such artificial materials are discussed as are manufactured from Phenols (in which name the *cresols* are included). In so far as they are condensed with formaldehyde, they are often designated as P.F. resins. As further representatives, also the *aniline* resins are classified in this group, although they might be considered as amides.

The phennol-formaldehyde resins belong to the most prominent polymers. They owe this particularly to the fact that they are capable of hardening rapidly, which property is owned in the same degree by the amino plastics. The consumption of phenol-formaldehyde resins in the U.S.A. during 1947 is estimated [1] to be 100,000 tons as against the urea and melamine resins, 45,000 tons and polystyrene 40,000 tons. Moulding materials absorbed in 1946 60% of the resin, laminates 11%, adhesives 6% and all other applications 23%.

It may be brought to mind *) here that the fundamental hardening reaction of the phenol-formaldehyde resins is the following:

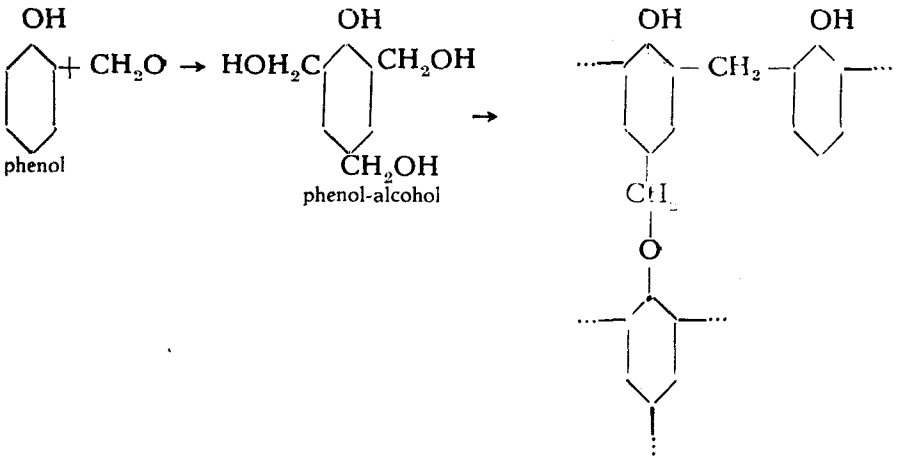

Fig. 1. Hardening of P.F. resins.

§ 2. Raw Materials.

Phenol, cresols and aniline are obtained from coal-tar. A first separation of the tar into its components is carried out by means of distillation; 4 principal groups are obtained, viz:

a. *Light oil*, evaporating up to a distillation temperature of 180°C (356°F). It contains 60-65% of benzene and its homologues.

*) See Volume I. Chap. 2; See for an extensive description: T. S. Carswell, Phenoplasts, New York 1947.

References p. 78.