CHAPTER 10

SUMMING UP

Polystyrene, a fairly low cost material, yet having beneficial properties, is abundantly available in the country due to the development of petrochemical industries in India. In this work, it has been established that polystyrene, in the form of polystyrene glycol can successfully be incorporated into surface coating materials such as alkyds and ester gum.

Functionalization of polystyrene by using simple chemical reactions imparts polarity into polystyrene. Reactions of polystyrene glycol with various simple acids and resins having carboxyl groups show that hydroxyl groups on polystyrene chain exhibit essentially the same reactivity as in a low molecular weight homologue and thus, indirectly support the theoretical argument of Flory, i.e., the concept of EQUAL REACTIVITY.

It was possible to blend polystyrene glycol with alkyds yielding industrially useful products having improved physical and chemical properties in the surface coating field. These blends were prepared because the interest in polymer blend system as a way to meet new market applications with minimum development cost, has increased rapidly. It is so because over the last decades, the poor economics of new polymer, copolymer production and need for new materials whose performance/cost ratio can be
closely matched to specific applications have forced polymer researchers to seriously consider purely physical polymer blend systems.

Polystyrene glycol is a versatile intermediate for copolymerization with different resins. It was copolymerized with ester gum and useful oleoresinous varnishes were prepared from them, which were otherwise not possible to prepare due to non-compatibility of polystyrene with oils.

Polystyrene glycol was also copolymerized with various alkyds. These copolymers were found to be superior to the styrenated alkyds already known to the surface coating field. Use of polystyrene glycol in place of a part of glycerol during the preparation of alkyd provides a new approach for the synthesis of styrenated alkyds without the use of conjugation in the fatty acid molecule. All alkyd based products prepared are listed in order of industrial merit as following: Copolymers > styrenated alkyds > blends > plain alkyds.