



# INTRODUCTION OF VARIOUS AMINE GROUPS ONTO POLYETHYLENE BEAD PREPARED BY RADIATION-INDUCED POLYMERIZATION

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Radiation-induced graft polymerization is a good method for modification of chemical and physical properties of polymeric materials because it can endow properties such as membrane quality, ion exchange, blood compatibility, dyeability, protein adsorption, and immobilization of bioactive materials. Polyethylene microbead is very useful material due to the following advantages; low price, simple purchase, high sensitivity, and simple analysis.

On the other hand, the epoxy group of the glycidyl methacrylate (GMA) can easily be converted to the various functional groups such as amines, alcohols, phosphoric acid, sulfonic acid, and amino acid, etc.

Cyclodextrin have been applied universally in various industries such as foods, cosmetics, pharmaceutical industry, analytical chemistry, and chemical industry. In order to obtain cyclodextrins, polyethylene microbead with the epoxy group were prepared by radiation-induced graft polymerization of GMA onto polyethylene microbead. The physical and chemical properties of the GMA-induced polyethylene microbeads were investigated by IR, thermal analysis (TGA/DSC), and SEM, respectively. Subsequently, the various amine groups such as diethylamine, diethylenetriamine, triethylamine, triethylenetetramine, and 1,6-hexanediamine were induced onto the epoxy group in polyethylene microbead. Finally, cyclodextrin glucanotransferase were immobilized onto polyethylene microbead with various amines under the various experimental conditions, such as pH, amin content, immobilization time, and etc. The activity of CGTase-immobilized polyethylene microbead was determined by Phenolphthein method. The production of the cyclodextrins from starch is in progress.