새로운 인지질계 Skin-care 가공제의 합성 및 가공특성

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1. Introduction

Environmental technology (ET) is already one of the most important technology area throughout the world and the demand of environmental friendly and biocompatible products are continuously increasing. Also in textile industry, lots of functional eco products such as antimicrobial, skin aging and atopy prevention, and moisturizing are continuously developed and introduced. Especially, biocompatible moisture finishing products for skin protection such as squalene, collagen, chitosan, and hyaluronic acid are very wide spread in cosmetics or medical care area. However, in textile industry, these materials were not so popular since the performance was unsatisfactory when applied to synthetic fibers.

Phospholipid polymer known as lipidure consists of hydrophilic phosphoric acid parts and hydrophobic lipid parts forming fats. It was already verified that they have functions of moisturizing, anti skin aging, antimicrobial and excellent stability since they have similar structures to cell membrane.

In this study, new biocompatible muti-functional textile finishing agents based on phospholipid 2-ethacryloyloxyethyl phosphorylcholine (MPCE) copolymer was synthesized and characterized for synthetic fibers such as polyester and nylon.

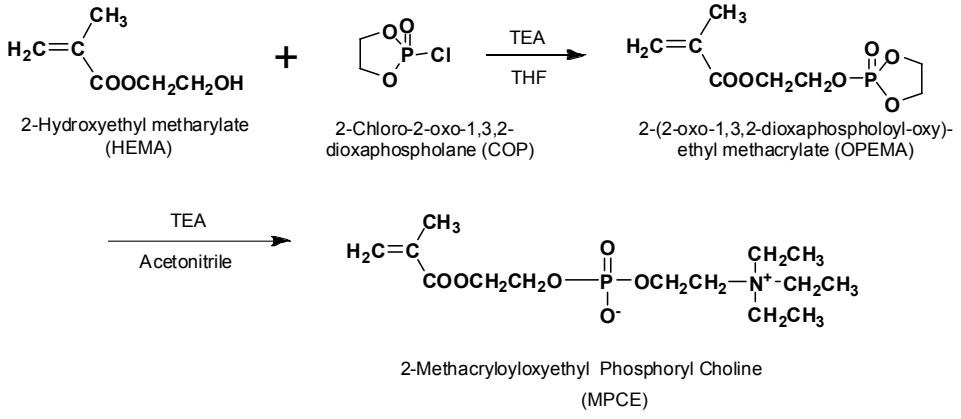

Fig. 1. The synthesis of MPCE.

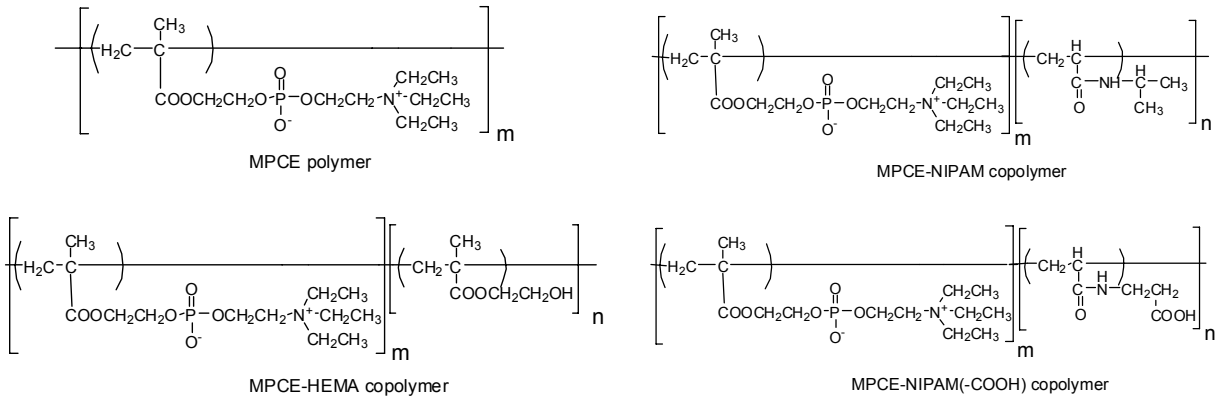

Fig. 2. The synthesis of MPCE polymer.

2. Experimental

2.1 The synthesis of OPEMA

Dry THF was placed into a 500 ml double walled vessel, and triethylamine (TEA) and 2-hydroxyethyl methacrylate (HEMA) were added to the solution. After the solution was cooled at 0 ℃, 2-chloro-2-oxo-1,3,2-dioxaphospholane (COP) in dry THF were added dropwise over a period of 1hr. The temperature of the reaction mixture was maintained at room temperature for 4hr. Then, the precipitate in the reaction mixture which was triethylammonium chloride was filtered off and the filtrate was evaporated under reduced pressure.

2.2 The synthesis of MPCE

OPEMA and dry acetonitrile were placed in a two-necked flask and triethylamine were added to the solution. After it was heated at 60℃ for 48h, the mixture was evaporated under reduced pressure. Evaporated under pressure to give colorless liquid produce, MPCE.

2.3 Polymerization

Synthesized MPCE were polymerized by homopolymerization or copolymerization with biocompatible monomer which were HEMA, NIPAM and carboxylic acid substituted NIPAM.

3. References

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