

# UV-curable polyurethane containing siloxanes for breathable water proof textiles

Tae Kyung Kim, Hee Moon Park

Korea Research Institute of Chemical Technology, Environment & Resource Research Center

## 1. Introduction

There has always been a demand for waterproof fabrics, especially for fabrics which at the same time are both waterproof and allow the passage of water vapor. Several methods have been proposed to obtain such functional fabrics.

These methods comprised the use of tightly woven specialty yarns, microporous coatings from materials such as PU or PVC and non-porous hydrophilic coating.

Another 'green' technology with a great potential is UV-radiation curing where solvent-free resins are cured at ambient temperature within seconds, thus consuming very little energy.

These two environmentally friendly technologies have been recently combined with the development of water based UV-curable resins. The focus of this study was to introduce UV curing system for breathable and waterproof fabrics

## 2. Experimental

### 2.1 Synthesis

In this study, we used the selected components for increasing flexibility, adhesive property and functionality and we prepared prepolymers by reaction of various diols, hydroxy alkyl acids and capping agents for controlling physical properties, breathable and waterproof properties.

The value of moisture vapor transmission rate and watertight pressure were investigated to monitoring the functionalities of the synthetic urethane acrylates.

## 3. Results and Discussion

The synthetic urethane acrylate containing siloxanes exhibited good flexibility, superior breathable and

waterproof properties for synthetic fabric.

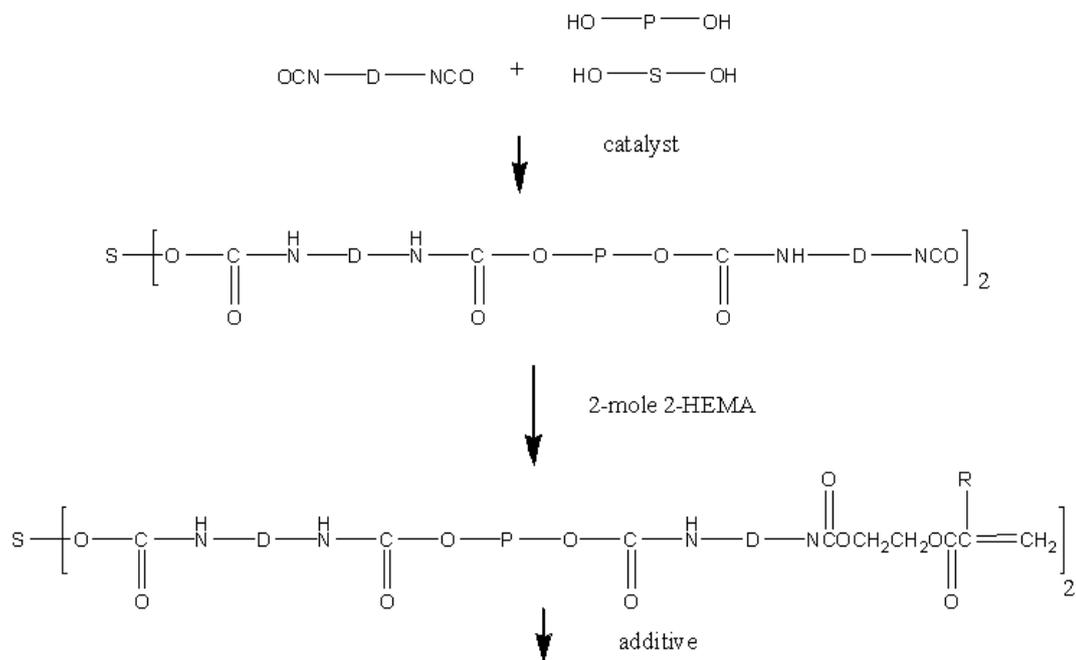


Fig. 1. Reaction scheme of the urethane acrylate prepolymer.

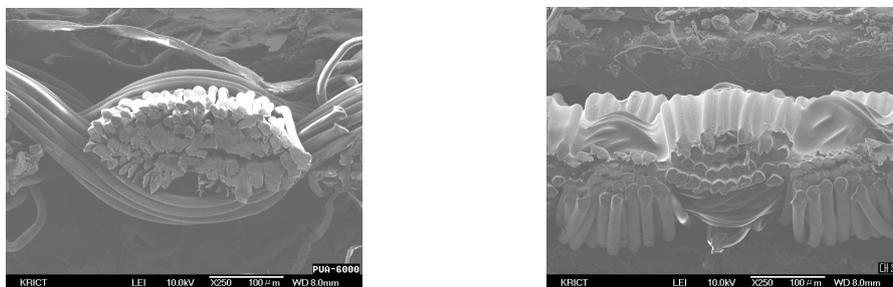


Fig. 2. Cross-sectional surface morphologies of the UV cured samples with urethane acrylate.

## Acknowledgements

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## References

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