

# Synthesis and Properties of Polydimethylsiloxane-Polyurethane

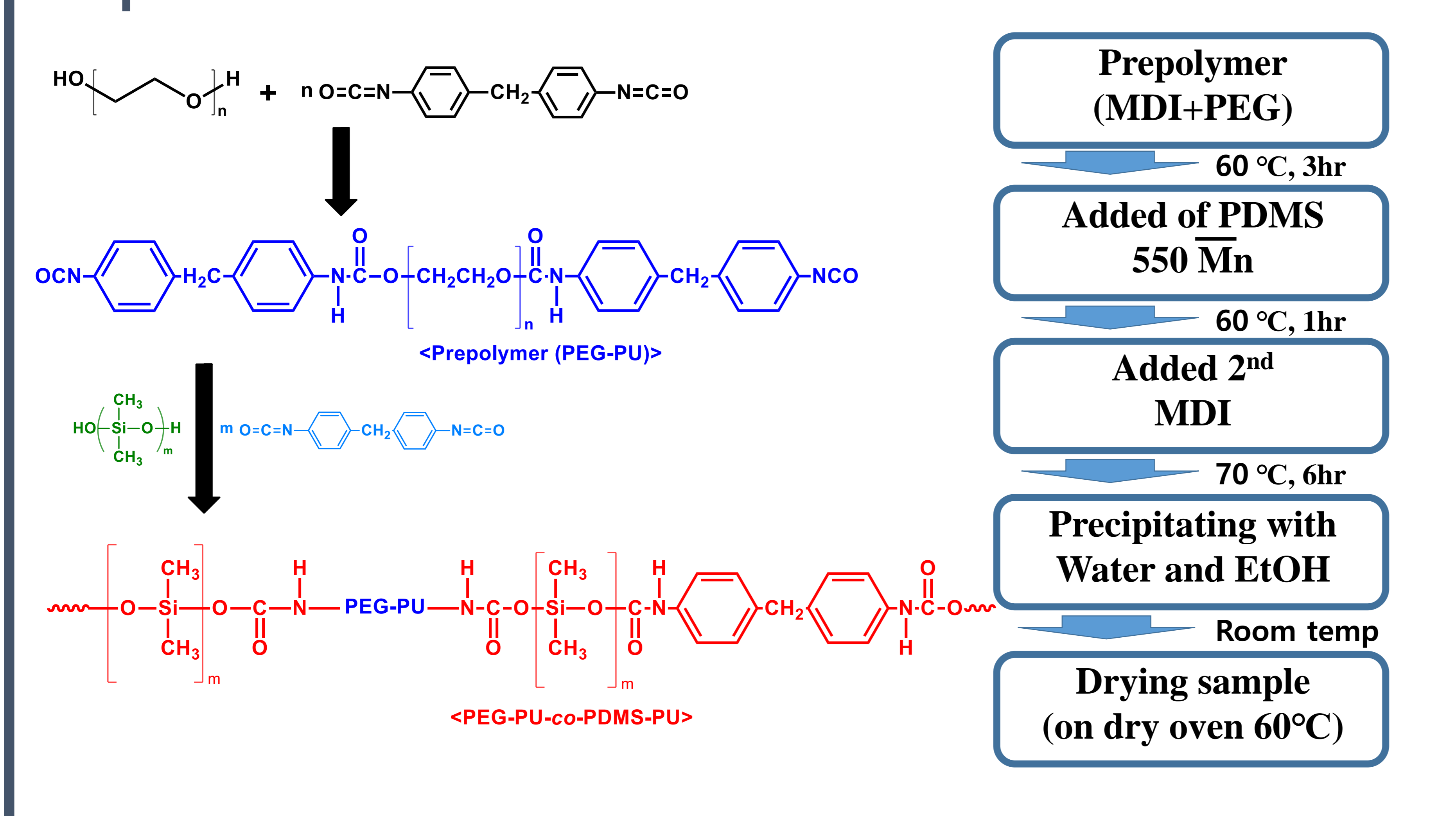
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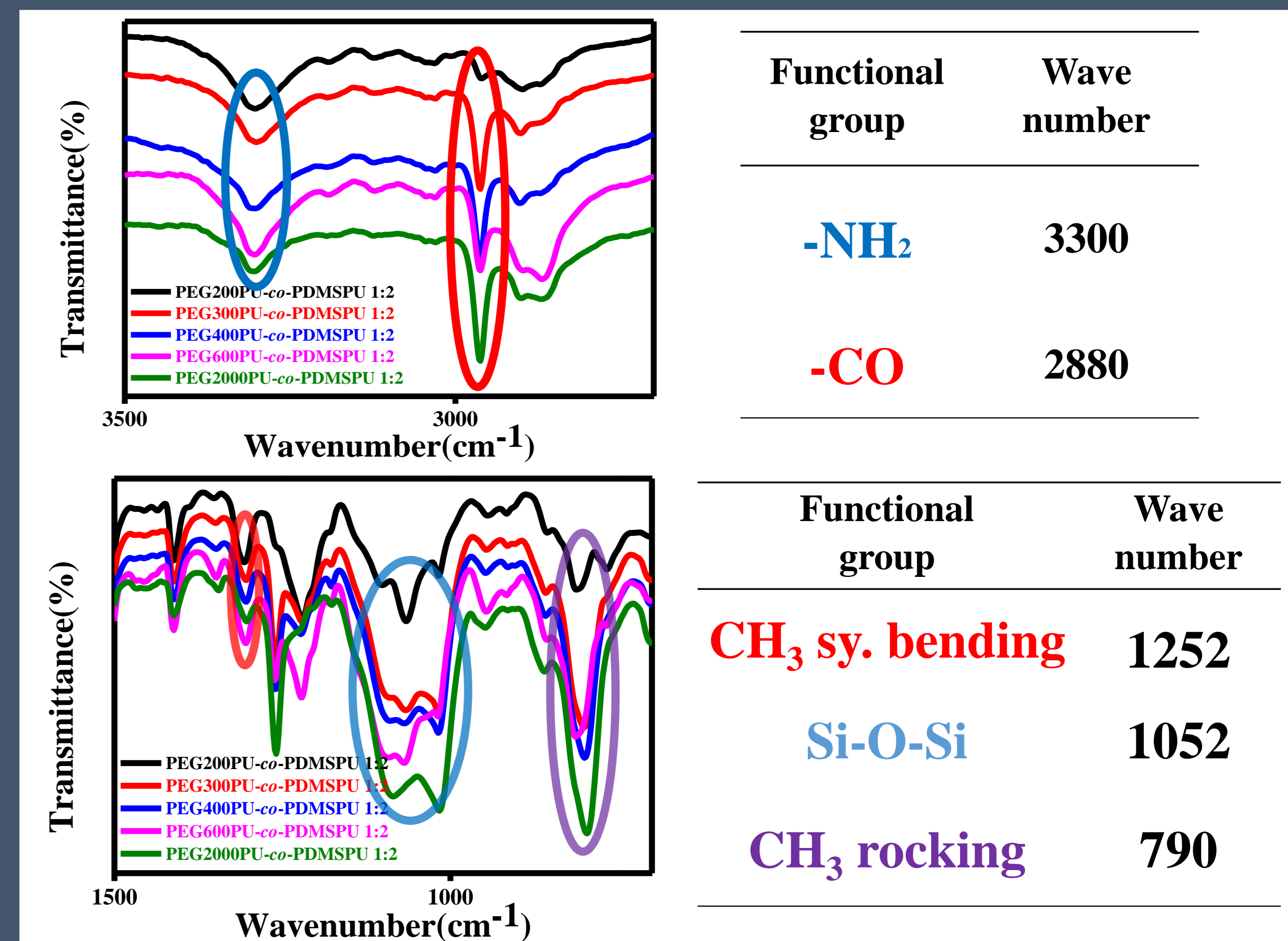
## Abstract

Polydimethylsiloxane-polyurethane (PDMS-PU) series were successfully synthesized based on the molecular weights dependence of siloxane polyol and one fixed polyethylene glycol polyol as the separated soft segments. The mechanical, surface, and water-barrier properties of the resultant PDMS-PU were evaluated using Universal Testing Machine (UTM), Contact angle, and Water Vapor Transmission Rate (WVTR) Tester. Rich PDMS phase at the air-polymer interface led to the effective phase separation between PDMS segments and urethane segments. Surface energies of PDMS-PU were the molecular weight and content dependence of PDMS. The optical transmittance and WVTR of PDMS-PU were analyzed to apply as an encapsulation material for electronic devices.

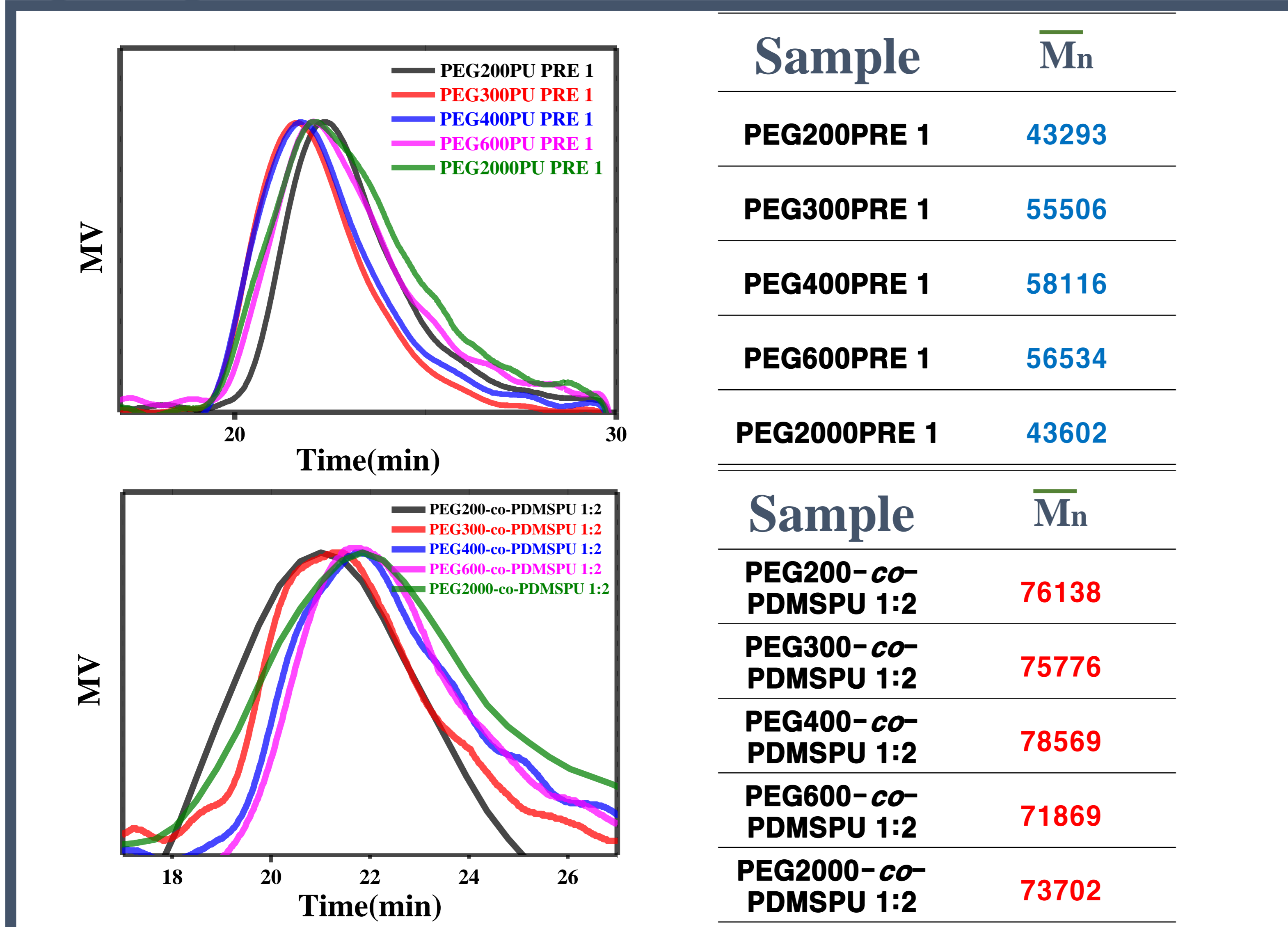
## Experiment



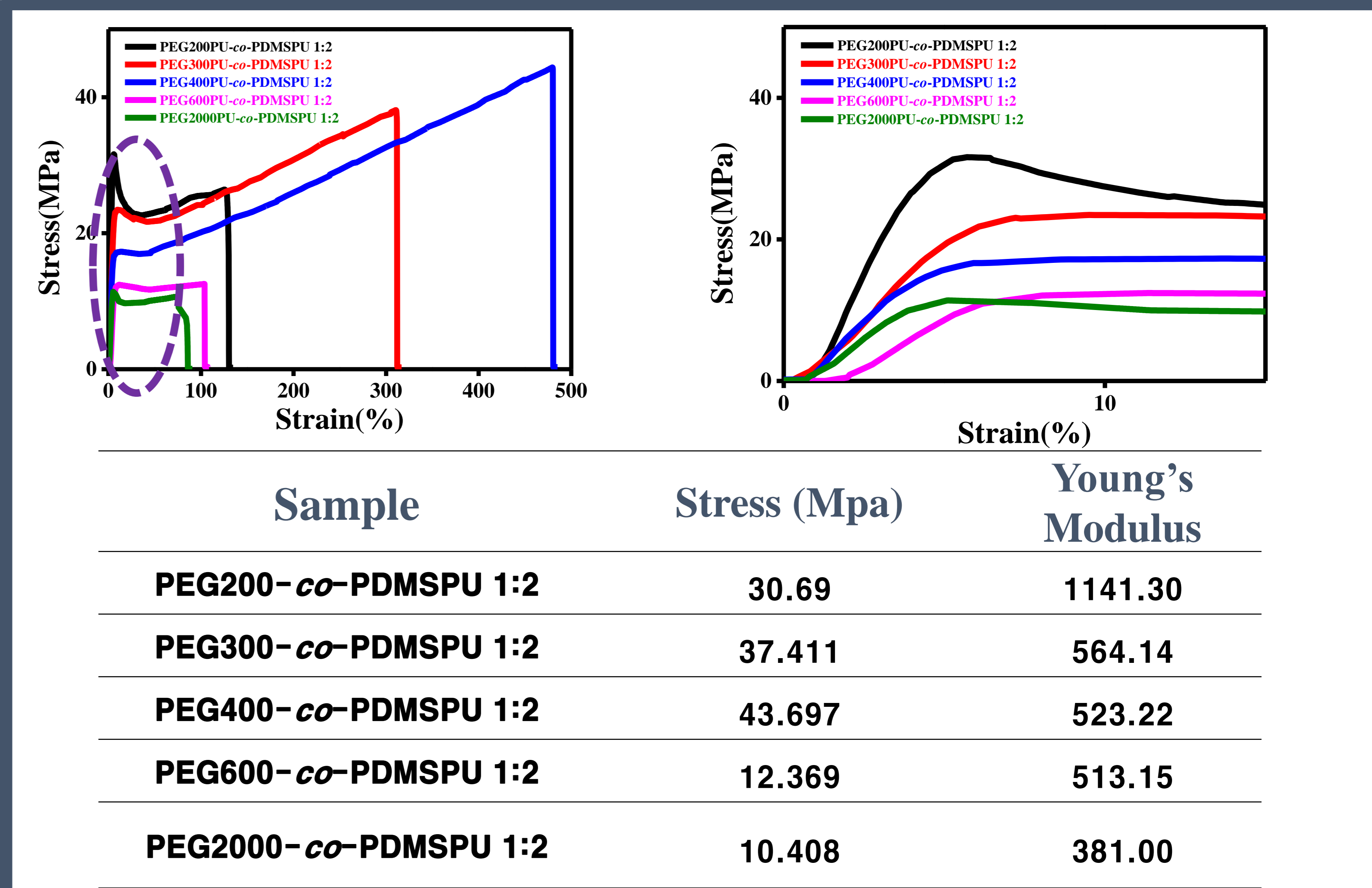
## FT-IR



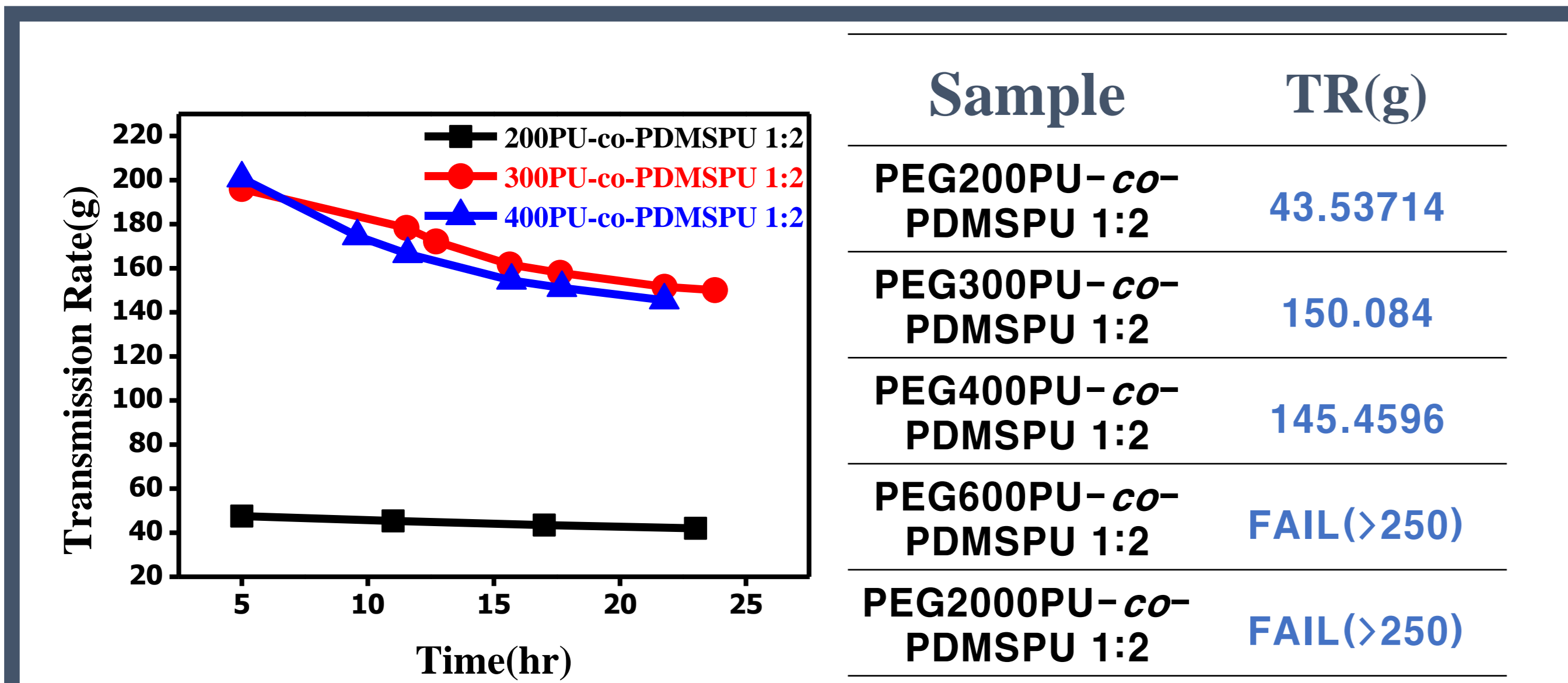
## GPC



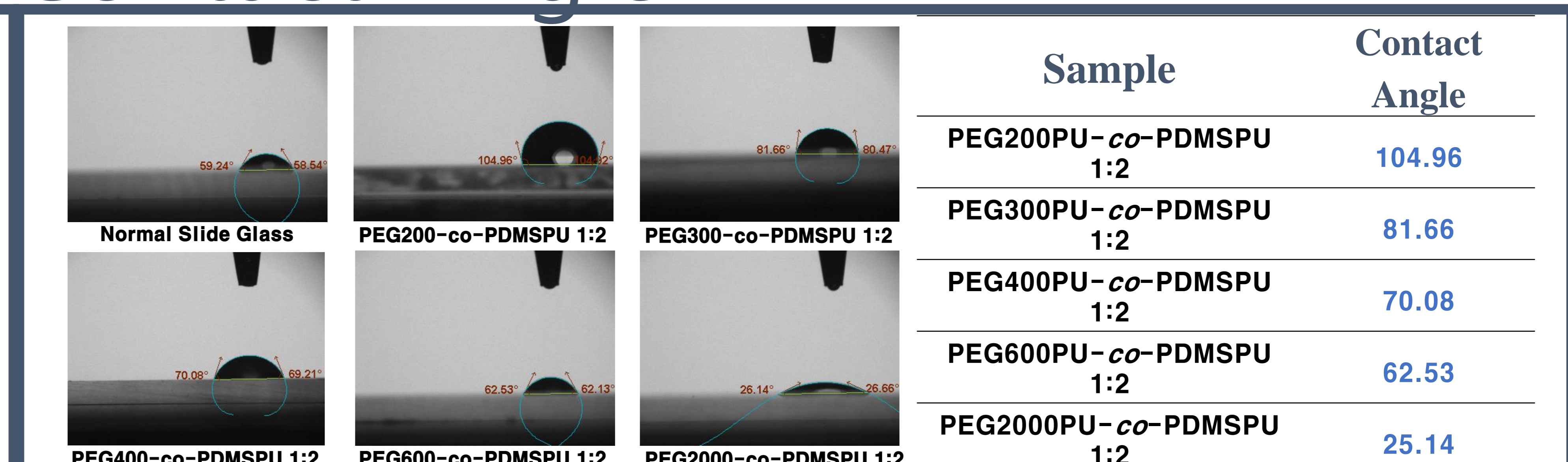
## UTM



## WVTR



## Contact Angle



## Conclusion

1. The successful synthesis of PEG-PDMS-PU using both PEG and PDMS blocks as soft segments
2. The good water barrier property of PEG200-PDMS-PU due to flat molecular packing structure
3. The high contact angle caused rich hydrophobic phase by many urethane groups.
4. The high Young's modulus of PEG200-PDMS-PU due to the strong H-bonding

## Acknowledgment

This research was financially supported by the Ministry of Trade, Industry and Energy (MOTIE) and Korea Institute for Advancement of Technology (KIAT) through the Research and Development for Regional Industry.