

TUNABLE PROPERTIES OF BETAIN-BASED MATERIALS

Peter Kasak

Center of Advanced Materials, Qatar University, P.O.Box 2713, Doha, Qatar

Polymeric materials containing betaine structures have increase interest for application in smart material for prevention of biofouling. Some of them as carboxybetaine ester are able to switch from carboxybetaine ester with positive charge to zwitterionic carboxybetaine with overall neutral charge. These smart materials can dramatically change properties and performance after transformation. [1]

In this contribution synthesis and application of carboxybetaine ester based polymeric materials will be presented. Transformation of ester group by pH or light trigger from cationic carboxybetaine ester to zwitterionic carboxybetaine will be elucidated. Differences in properties for tunable wettability, electrorheological characteristics, adhesion with metal particle and interactions with biological species as DNA, proteins, bacteria and others will be discussed and presented. Moreover, modulated upper critical solution temperature (UCST) after copolymerization will be elucidated.

Acknowledgements

This work was made possible by NPRP grant No.: 6 – 381 – 1 - 078 and 9-219-2-105 from the Qatar National Research Fund (A Member of The Qatar Foundation). The statements made herein are solely the responsibility of the authors.

[1] M. Ilcikova, J. Tkac, P. Kasak, "Switchable materials containing polyzwitterion moieties." *Polymers*, **2015**, 7, 2344–2370