

Lys-catechol pair effect on underwater mussel adhesion

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Non-covalent interactions have attained many attentions in various areas including molecular recognition, biological self-assembly, and molecular adhesion. Among them, cation- π interaction has been suggested as crucial intermolecular interaction in underwater adhesion recently. In specific, several studied have shown that cation- π interaction is the main contributor to the liquid-liquid phase separation (LLPS) in underwater for mussel-inspired materials. Also, molecular cohesion forces found out to be tuned by changing π candidate in underwater. In this study, we focused on how the position of cation sources could affect intermolecular cation- π interactions in underwater using surface forces apparatus (SFA), Raman spectroscopy, and NMR. Model peptides were synthesized for nanomechanical studies. Underwater cation- π interactions were measured by (1) different aromatic π sources, (2) salt concentrations, and (3) reversibility of non-covalent interactions. This study could suggest that cation sources might deteriorate intermolecular cation- π interactions and could give insight on designing biomaterials using in underwater.