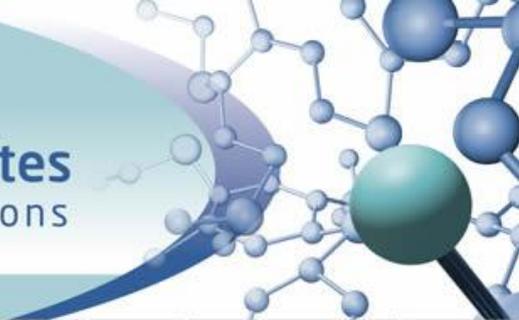


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RESPONSIVE AND INTERNALLY STRUCTURED SURFACE COATINGS OF WATER-INSOLUBLE POLYION-SURFACTANT ION COMPLEX SALTS

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Water-insoluble "complex salts", consisting of polyions and surfactant ions of opposite charge, are known to form a variety of hydrated structures when exposed to excess water [1]. Such hydrated complex salts are thus interesting candidate materials as internally structured surface coatings, featuring both hydrophobic and hydrophilic domains.

We here explore a facile method to produce hydrated but water-insoluble, responsive and internally structured surface coatings via deposition of polyion-surfactant ion complex salts dissolved in ethanol. Since complex salts are soluble in ethanol [2, 3], it is possible to cast a complex salt film [4] by simply spreading an ethanolic solution onto a surface. Good wettability is found for a variety of hydrophilic and hydrophobic surfaces. When such a complex salt film, initially dry, is immersed in water, it immediately responds by swelling, but it does not dissolve. The structures of the hydrated complex salt coatings can be controlled by varying the polyion and/or surfactant ion, by adding a co-surfactant or, interestingly, by controlling the water activity. SAXS studies confirm that the same structures are present in the thin surface films as in the corresponding bulk phases [1]. As the water content increases the structure may change, for example, from hexagonal to micellar cubic. The structures in the complex salt films also respond to the addition of alcohols or surfactants in the aqueous solution in contact with the film.

References

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