

Supramolecular Ordering of Polydopamine Films



Polydopamine (PDA) is a widely used biomimetic polymer with many applications in biomedicine, electronics and energy. It has been generally regarded as a multifunctional polymer with almost endless applications. However, many aspects of this polymer are still not understood. For example, although generally accepted as an amorphous polymer, all its building blocks are organized randomly in a chaotic manner. However, an exciting event takes place at the so-called air/water interface. When the PDA reaction takes place in a large enough recipient, it produces a film-like structure on the water surface, much like the skin on boiled milk. This film-like structure has recently been shown to have a previously unknown order, resembling that of 2D materials such as graphene or other Van der Waals materials. This result contradicts the generally accepted amorphous nature of the polymer, but it also suggests that water surface tension can be responsible for this ordering. Nevertheless, whatever the reason behind this ordering, it opens immense possibilities for research and application since it provides a unique look into the molecular structure of this polymer and allows us to investigate its structure.

This project aims to investigate and characterize this never seen structure to provide comprehensive and deep knowledge of the structure and applications of this marvellous polymer.

