A copolymer of polyvinylpyrrolidone and 1-triacontane (PVP/TA) is known to be highly hydrophobic. The hydrophobicity renders PVP/TA fibres potentially suitable for capturing and separating molecules from fluids through physical interactions. This ability to tailor the interaction between multi-component liquids and fibre surfaces to take advantage of phenomena such as mutual hydrophobicity and oleophilicity is important in numerous applications such as filter media, chemical sorbents and protective clothing.

The number of adsorption sites for bonding and capture can be increased by forming the PVP/TA polymer in to fine, sub-micron fibres. This paper discusses the manufacture of this copolymer using centrifugal spinning/forcespinning. Centrifugal spinning has been proposed as a highly versatile and scalable alternative to electrospinning capable of processing polymer solutions and polymer melts. Centrifugal spinning relies on rotational inertial forces to generate a polymeric jet which is then elongated by aerodynamic and rotational forces. This approach was used to form nanofibrous webs from a PVP/TA co-polymer through melt spinning.

This presentation will discuss the issue of disperse dye discharge in dye house effluent; the production of PVP/TA fibres via melt centrifugal spinning; the effect of processing conditions on fibre diameter; the brittle nature of the fibres and impact of copolymer fine structure; the application of these fibres as a capture agent and the “mutual hydrophobicity” which attracts and binds soils and disperse dyes to the surface of the fibre.