

Project 19-53-15012-NCNI_a

«Adaptive double networks»

Annotation of the project

The project aims at the development of novel hydrogel materials based on a double network consisting of a supramolecular network of cylindrical surfactant micelles and a polysaccharide network cross-linked with dynamic covalent bonds. The hydrogels will combine highly responsive properties inherent to non-covalent supramolecular structures and mechanical strength due to polymer component. Dynamic cross-links between macromolecules will provide to the polymer network the ability to react to changes in the micellar network and adapt to them, so that the whole system will demonstrate strong responsive properties. We will study the rheological properties, the structure and the molecular interactions of the double networks by several complementary techniques. Particular attention will be paid to the ability of the gels to be destroyed upon contact with hydrocarbons, which is of obvious interest for their use in fracturing fluids in oil recovery as it provides an effective clean-up of strata at the flow of oil.