POLYUREA-CROSSLINKED BIOPOLYMER AEROGELS - NOVEL NANOSTRUCTURED MATERIALS FOR DIVERSE APPLICATIONS

Patrina Paraskevopoulou

Inorganic Chemistry Laboratory, Department of Chemistry, National and Kapodistrian University of Athens, Panepistimiopolis Zografou 15771, Athens, Greece

Biopolymer aerogels are attractive materials because they come from natural resources, are biocompatible, biodegradable and non-toxic, are prepared in water, bear a large number of functional groups available for coordination to metal ions, hydrogen bonding, functionalization etc., and some of them, may be converted pyrolytically to carbon aerogels. However, the main drawback of most biopolymer aerogels is that they are mechanically weak materials. This issue was rectified recently with the synthesis of polyurea-crosslinked biopolymer (X-biopolymer; Figure 1) aerogels [1]. For example, X-alginate aerogels can be as strong as the best organic aerogels at half or one third of their density, and extremely stable in all aqueous environments with pH in the range of 3-9. The material properties of X-biopolymer aerogels can be tuned by a number of factors, including the nature of the biopolymer, the chemical identity of the triisocyanate, their relative concentrations, and the synthetic parameters, according to the specific applications.

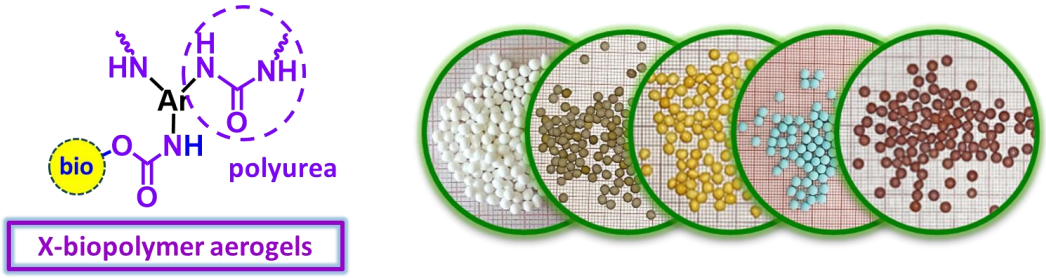

Figure 1

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References

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