Chem Sci J 2018, Volume 9
DOI: 10.4172/2150-3494-C2-021

8th European Chemistry Congress

June 21-23, 2018 | Paris, France

An efficient and sustainable method for producing lignin nanoparticles using neutral hydrotrope solution

Liheng Chen
Jinan University, China

Lignin, which is the main organic composition in the renewable and abundant plant cell wall, was hard to utilize because of its complicated chemical and physical structure. Lignin nanoparticles (LNPs), as a highly-valued nanomaterial, could have potentials in many applications such as biomaterials, engineering materials, templates or stabilizers like regular polymer nanoparticles for the production of smart materials, etc. However, efficient and sustainable methods of LNPs preparation were rarely to report. Here a facile preparation of LNPs was described. The sodium p-toluenesulfonic (pTsNa) where its concentrated aqueous solution shows hydrotropic property was firstly used to dissolve the lignin. The solubility of lignin in pTsNa concentrated aqueous solution could reach over 200 g/L. Then LNPs can be easily to form due to the π-π stacking interaction between lignin molecules through diluting the concentrated solution to below the minimal hydrotrope concentration (MHC). The LNPs properties including size (ranging from 50 to 800 nm) and zeta potential (ranging from -20 to -40 mv) can be also tailored *via* changing the lignin concentration in the solution, the diluting factors and the centrifuging force. Meanwhile, pTsNa has a relatively low water solubility, which facilitates efficient recovery simply using commercially proven crystallization technology by cooling the concentrated aqueous solution to ambient temperatures to achieve environmental sustainability through recycling of pTsNa. This preparation approach will have a possibility to realize the industrial processing and large scale applications of LNPs.

lihengchen@jnu.edu.cn