

A Surfactant Based Low Molecular Weight Hydrogelator with Unprecedented Stability

Summary

Low molecular weight hydrogelator (LMHG) formulations are rare, but are preferred over polymeric hydrogels because of their improved biodegradability, biocompatibility and disintegration. Unfortunately, existing LMHGs often fall apart under slight environmental changes, seriously limiting their utility. However, the novel LMHG presented here is able to gelate >95% water in both acidic and basic forms, is robust to environmental changes, and has promising utility in controlled drug release, RNA delivery, tissue engineering, cosmetics, cancer therapy, biomaterials and other chemical industries, making it a promising new material for many different industries.

Addressed Need

There is a need for a LMHG that can gelate water irrespective of the pH conditions while also retaining its integrity as a gel. Other properties that are desirable for LMHGs include biocompatibility, biodegradability, antimicrobial activity, and good surface activity. With such properties, there are many potential applications in formulations, encapsulation and sustained release of hydrophobic materials.

Unique Features

This LMHG can gelate 97 and 95 wt% water in both acidic and basic forms, respectively, and retains its integrity in pH conditions that vary from pH 1.2 to 10. Additionally, this LMHG is derived from an inexpensive starting material that is biodegradable. Furthermore,

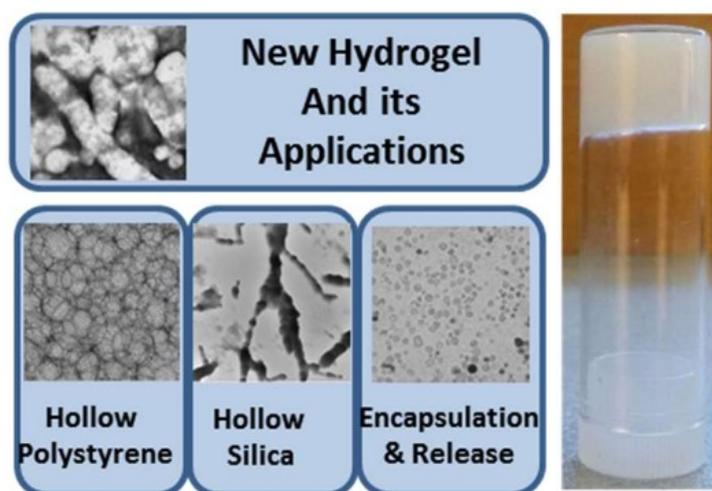
this LMHG is surface active, possesses antimicrobial properties, and forms bilayer structures under different pH conditions.

Applications

The useful features of this material make it useful in many different applications that require a surfactant, ranging from agrochemical based formulations to antimicrobial wall coatings. Applications that have already been demonstrated include encapsulation and sustained release of drugs and hydrophobic materials, emulsion formulation, emulsion polymerization, and synthesis of hollow polymeric and silica particles and nanoparticles.

Technology & IP Status

The material has been synthesized, fully characterized, and used in representative applications. A patent application was filed.



This novel low molecular weight hydrogel has exciting properties and many useful applications across a range of industries.

CTTC CONTACT:

Masood Machingal, Ph.D.
(615) 343-3548
masood.machingal@vanderbilt.edu

INVENTORS:

Prasad L. Polavarapu, PhD
Vijay Raghavan, PhD

VU REFERENCE: VU 18054

Visit <http://cttc.co/technologies> for available Vanderbilt technologies for partnering