



Luyi Sun

Texas State University—San Marcos, USA

Methane hydrates with a high capacity and high formation rate promoted by biosurfactants

Gas hydrates, or gas clathrates are non-stoichiometric, crystalline inclusion compounds composed of a hydrogen-bonded water lattice which traps small molecules within polyhedral cavities. Recently, gas hydrates have drawn significant interests in the potential applications in the separation, capture, storage, and transportation of a wide range of gases, including methane, carbon dioxide, and hydrogen. However, there are two key issues to be addressed: slow formation rate and low capacity. Herein, we report the use of lignosulfonates (LSs), a promoter derived from biomass, for the rapid formation of high capacity methane hydrates. LSs, which are byproducts of paper industry, can be used as effective promoters for the formation of methane hydrate in terms of both formation rate and storage capacity (up to 170 v/v under standard temperature and pressure). The lignosulfonates promoted system also exhibited excellent recyclability. Such improvements are expected to contribute to the commercial applications to methane hydrates in the near future.

Biography

Luyi Sun received his Ph.D. from The University of Alabama in 2004 and conducted his postdoctoral studies at Texas A&M University. In 2006, Dr. Sun joined TOTAL Petrochemicals USA, Inc. as a senior research engineer. In 2009, Dr. Sun moved to Texas State University. Dr. Sun has authored over 50 papers in peer-reviewed journals, two book chapters, and delivered over 60 talks at national/international conferences. He is credited for 25 US/International Patents or Patent Applications. Dr. Sun currently serves as an editorial board member of *Journal of Plastic Film and Sheeting* and *Dataset Papers in Materials Science*.

luyi.sun@txstate.edu