

## Accepted Manuscript

Synthesis of a novel tunable lignin-based star copolymer and its flocculation performance in the treatment of kaolin suspension

Zuguang Liu, Xiang Lu, Junkang Xie, Bo Feng, Qiaoning Han

PII: S1383-5866(18)30640-3  
DOI: <https://doi.org/10.1016/j.seppur.2018.08.025>  
Reference: SEPPUR 14846

To appear in: *Separation and Purification Technology*

Received Date: 24 February 2018  
Revised Date: 27 June 2018  
Accepted Date: 12 August 2018

Please cite this article as: Z. Liu, X. Lu, J. Xie, B. Feng, Q. Han, Synthesis of a novel tunable lignin-based star copolymer and its flocculation performance in the treatment of kaolin suspension, *Separation and Purification Technology* (2018), doi: <https://doi.org/10.1016/j.seppur.2018.08.025>

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.



## Synthesis of a novel tunable lignin-based star copolymer and its flocculation performance in the treatment of kaolin suspension

Zuguang Liu<sup>a,b,\*</sup>, Xiang Lu<sup>a,b</sup>, Junkang Xie<sup>a,b</sup>, Bo Feng<sup>a,b</sup>, Qiaoning Han<sup>a,b</sup>

*a. School of Chemistry and Chemical Engineering, Guangxi University for Nationalities, Nanning, Guangxi, 530008, China*

*b. Guangxi Key Laboratory of Chemistry and Engineering of Forest Products, Nanning, Guangxi, 530008, China*

*\*Corresponding author (Z. Liu). Fax: +86 731 3260558, E-mail: gxmd311lab@163.com*

**Abstract:** In current work, lignin-based multi-arm star copolymer phenolated kraft lignin-graft-poly (2-methacryloyloxyethyl) trimethyl ammonium chloride (PKL-g-PDMC) was designed and synthesized as a new kind of cationic flocculant via Steglich esterification of PKL and subsequent RAFT polymerization with DMCs, and its flocculation performance in the removal of kaolin particles from simulated wastewater was evaluated. The star PKL-g-PDMCs with varying graft density and arm length of PDMCs chains were characterized by <sup>1</sup>H-NMR, <sup>31</sup>P-NMR, GPC and TGA. The effects of graft density and arm length, PKL-g-PDMC dosage, suspension pH and settling time on flocculating performance were investigated by measuring residual turbidity of the settled suspension. The treatment was effective, as demonstrated by 96.4 % efficiency of turbidity removal. Above all, the chemical structure of the copolymers, including graft density and the arm length, can be designable and tunable by simply changing feeding ratios of Steglich esterification and subsequent RAFT polymerization, and thus the best flocculation performance can be obtained. This work provides a blueprint for the design, synthesis and use of novel lignin-based multi-arm star

Download English Version:

<https://daneshyari.com/en/article/7043437>

Download Persian Version:

<https://daneshyari.com/article/7043437>

[Daneshyari.com](https://daneshyari.com)