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Heteropoly acid catalytic treatment for reactivity enhancement and viscosity control of dissolving pulp

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Abstract

The reactivity enhancement and viscosity control are of practical importance during the manufacture of high-quality cellulose (also known as dissolving pulp). In the study, the concept of using phosphotungstic acid (HPW) for this purpose was demonstrated. The Fock reactivity of resultant pulp increased from 49.1% to 74.1% after the HPW catalytic treatment at a dosage of 86.4 mg HPW/ g odp. The improved results can be attributed to the increased fiber accessibility, thanks to the favorable fiber morphologic changes, such as increased pore volume/ size, water retention value and specific surface area. HPW can be readily recycled/ reused by evaporating method, where maintaining 87.1% catalytic activity after six recycle times. The HPW catalytic treatment concept may provide a green alternative for the manufacture of high- quality dissolving pulp.

Key words: Dissolving pulp, phosphotungstic acid, catalytic treatment, Fock reactivity, viscosity

Introduction

In recent years, the converting of biomass to various products, namely