



“Gheorghe Asachi” Technical University of Iasi, Romania



ENVIRONMENTALLY FRIENDLY CELLULOSIC FIBERS FROM CORN STALKS

**Ana Maria Cheșcă, Bogdan Marian Tofănică, Adrian Cătălin Puițel,
Raluca Nicu, Dan Gavrilăscu***

*“Gheorghe Asachi” Technical University of Iasi, Faculty of Chemical Engineering and Environmental Protection,
Department of Natural and Synthetic Polymers, 73 Prof.dr.doc. Dimitrie Mangeron Street, 700050 Iasi, Romania*

Abstract

One of the main causes of global climate change is deforestation. Wood is largely used in construction, furniture, and pulp and paper industries, which consume hundred of millions of cubic meter of wood year by year. Forest surfaces decrease rapidly at global level and this reality is of crucial importance for world global ecological footprint. Shortage of pulpwood for paper industry became a great challenge and, for this reason, other raw materials must be taken into consideration. Recovered paper is the most important raw material for paper industry, but low paper grades can be produced only. Collection rate of recovered paper is high in most countries and there are no additional quantities to assure the large requirements of the paper industry. Today, nonwood plants are considered more and more important raw material for this industry. Wheat and rice straws are used for decades to produce chemical pulp in many Asian and European countries.

This paper investigates the possibility of replacing pulpwood with corn stalks as raw material in producing chemical pulp for paper. Corn stalks are abundant agricultural waste in Romania, since more than 12 million tones of stalks were generated in 2017. It was found that corn stalks contain less lignin than wood and can be delignified using less chemicals, at lower temperatures and in shorter time. Moreover, corn stalks can be processed using ordinary reagents like sodium hydroxide, and pulps with different yields and lignin content can result. Natron pulping of corn stalks offers pulps with reasonable strength properties which can replace wood pulp in obtaining papers for corrugated board.

Key words: corn stalks, pulping, paper, resources

Received: December, 2017; Revised final: May, 2018; Accepted: June, 2018; Published in final edited form: July 2018

* Authors to whom all correspondence should be addressed: e-mail: gda@tuiasi.ro