Evaluation of the influence of lipophilic extractive residues on dissolving pulp quality parameters by partial least squares method of chemometrics

Author(s)

Kessy F. Kilulya, Bhekie B. Mamba, Catherine Ngila, Tamara Bush, and Titus A.M. Msagati

Abstract

Dissolving pulp samples collected from the various pulping stages of the acid-bisulphite process were analysed for the lipophilic extractive residues as well as their effects and influence on the quality parameters of dissolving pulp were evaluated. The results obtained using the partial least squares (PLS) regression model showed that sterols, fatty alcohol, saturated and unsaturated fatty acids significantly influenced/affected the viscosity, Kappa number and carbohydrates in the pulp. The PLS model clearly separated the analysed pulp in terms of the species of the raw materials and pulping stages. Furthermore, it was observed that lipophilic extractives are negatively correlated to the yield of α-cellulose. Sterols, fatty acids and alcohols negatively influenced glucose in pulp, while xylose was found to be positively correlated to these components. Generally, the components of lipophilic extractives that have a major influence on the quality parameters were found to be sterols and saturated fatty acids.

Keywords

Chemometric methods, Dissolving pulp, Lipophilic extractives, Partial Least Squares (PLS)