

BLEACHABILITY OF KRAFT PULPS OBTAINED FROM *E. GLOBULUS* MIXTURES WITH *E. UROGRANDIS* OR *E. NITENS*

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ABSTRACT

The objective of this work was to evaluate the bleachability of kraft pulps produced from individual *Eucalyptus* species and their mixtures: *E. globulus*, *E. nitens*, *E. urograndis*, and mixtures of 70% *E. globulus* with 30% of the other species. *E. nitens* can be used in reforestation in colder geographic regions and, although it has a similar chemical composition, the lower wood density, implies a loss of the industrial productivity potential. On the other hand, *E. urograndis* has a chemical composition that requires more aggressive cooking conditions, and its incorporation together with *E. globulus* leads to a loss of the production potential of the latter. Besides chemical composition analysis and optimization of kraft cooking conditions to achieve the target degree of delignification with the least possible degradation of polysaccharides, the bleaching performance should be studied (assessed by the consumption of oxidizing chemical reagents).

Unbleached pulps were available with two levels of residual lignin content: kappa number, KN, ~18 and ~15. An ECF (Elemental Chlorine Free) bleaching sequence was applied, with and without oxygen predelignification: (O/O)₀E_pD₁D₂ for KN ~18 and D₀E_pD₁D₂ for KN ~15. The total chlorine dioxide charge (or kappa factor) was adjusted to achieve an ISO brightness of 90%.

The unbleached pulps produced from *E. globulus* exhibited higher viscosity than the other pulps, for both groups of KN~15 and ~18, although the latter one always presented higher viscosities, due to the less aggressive cooking conditions. At the end of the bleaching sequence, the relative order of viscosity between pulps was maintained. The production of less delignified pulps (KN~18) allows the use of an O/O stage (which is less selective than chlorine dioxide) and, even so, to obtain bleached pulps with a viscosity level slightly higher than that of bleached pulps produced from KN~15 pulps. Is thus essential to use the intrinsic viscosity determination as a control parameter for the degree of degradation of polysaccharides during cooking, in parallel with the determination of kappa number to control the degree of delignification.

Regarding bleachability, *E. globulus* pulps, due to higher S/G ratio of their lignin, outperformed those of *E. urograndis* or *E. nitens*, for similar kappa number. The mixtures of *E. globulus* with *E. urograndis* showed an intermediate performance than the single species. Furthermore, bleachability was dependent on the cooking conditions to obtain the same KN. It was also confirmed that the presence of the oxygen stage, applied on KN~18 pulps, leads to a higher reagent requirement, making these pulps more difficult to bleach. However, the bleached pulps (O/O)₀E_pD₁D₂ showed characteristics with smaller differences between them (and within each species). It can then be inferred that the application of an oxygen stage attenuated the differences between unbleached pulps produced under different cooking conditions.

Keywords: Bleachability, *Eucalyptus globulus*, *E. nitens*, *E. urograndis*, wood mixtures.

This work was carried out under the Project inactus – innovative products and technologies from eucalyptus, Project N.º 21874 funded by Portugal 2020 through European Regional Development Fund (ERDF) in the frame of COMPETE 2020 nº246/AXIS II/2017.