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## Pulping

00001

PI: 20203902 JA: 0203

TI: Cleaning and passivation of pulp drying machines

AU: Freire F C

JN: Papel \$IS=

CI: vol. 62, no. 4, Apr. 2001, pp 98-102 (C, K, S)

CT: CASE STUDY/ CLEANING/ CORROSION/ CORROSION CONTROL/ DRYER SECTION/ STAINLESS STEEL/ WET MACHINE/

AB: Although the stainless steel utilised in pulp drying and dewatering machines have a passive layer that protects it from corrosion, if this layer becomes unstable, corrosion can occur. A case study evaluated the cleaning and the passivation undertaken at Cenibra's no. 3 pulp drying machine, which exhibited an advance process of corrosion, including intense pitting, at the time prior to the described procedure. Two types of cleaning procedures were used prior to the passivation, a mechanical one, using steel brushes, and a chemical one, conducted with two kinds of acid solutions. The passivation stage involved the use of decapping solutions at room temperature. Since cleaning and passivation does not guarantee the occurrence of further corrosion, it was decided on the routine application of corrosion inhibitors in the white water. (1 fig, 4 tab)

SO: B

00002

PI: 20203909 JA: 0203

TI: Hexenuronic acids. Part 1: origin, methods of quantification, reactivity and behaviour during kraft pulping

AU: Moreira da Costa M; Mounteer A H; Colodette J L

JN: Papel \$IS=

CI: vol. 62, no. 5, May 2001, pp 75, 77-85 (C, K, S)

CT: KAPPA NUMBER/ KRAFT PULPING/ QUANTITATIVE ANALYSIS/ REACTION KINETICS/ REACTIVITY/ URONIC ACID/ XYLAN/

AB: A large proportion of the kappa number of a kraft pulp is dependent on the presence of hexenuronic acids (HexA's). Long fibre pulps have less HexA's than short fibre pulps, which means that the contribution of HexA's to kappa is greater in short fibre pulps. The pulps with a high concentration of HexA's also offer a higher yield. Such HexA's present in bleached kraft pulping processes are formed from moieties of glucuronic acid attached to the xylans under certain concentrations of hydroxide and sulphide, and their role is to protect the xylans from depolymerisation. The quantification of the HexA's in both pulps and effluents is carried out in two steps, the first consists of their selective acid degradation and the second of their determination through chromatographic or spectrographic techniques. (12 fig, 3 tab, 22 ref)

SO: B

00003

PI: 20203913 JA: 0203

TI: Mechanical and chemimechanical hardwood pulps: is the Eucalyptus suitable raw material?

AU: Ellmen C J

JN: Papel \$IS=

CI: vol. 62, no. 6, June 2001, pp 32pt; 33en (C, K, S)

CT: CHEMIMECHANICAL PULP/ CHEMITHERMOMECHANICAL PULP/ CMP/ CTMP/ EUCALYPTUS/ HARDWOOD PULP/ MECHANICAL PULP/

AB: Mechanical pulps are used to produce good quality printing paper and newsprint. Chemimechanical pulps are typically used for products of higher freeness such as fluff, tissue and board grades. Although most such pulps are produced from Norway spruce (*Picea abies*), certain hardwood species, such as aspen have also proved feasible in this process, although a chemical pretreatment is required. An alternative is the use of alkaline peroxide mechanical pulping (APMP) of hardwood species. Eucalyptus is suitable for the production of both alkaline peroxide mechanical pulp (APMP) and chemithermomechanical pulp (CTMP). Bleached CTMP (BCTMP) has been increasingly produced since the mid 1980s and over 50% of world production is now from hardwoods such as aspen, birch and maple. Eucalyptus may also be suitable for BCTMP production and there is clear potential in Latin America. (Short article)

SO: B

00004

PI: 20203920 JA: 0203

TI: Comparison of conventional lime kilns and of Verti-Reactor

AU: Blotz R P

JN: Celul. Pap. (Chile) \$IS=0716-2308

CI: vol. 15, no. 2, June 1999, pp 22-28 (C, K, P, S)

CT: COMPARISON/ DESIGN/ ENERGY CONSUMPTION/ HEAT TRANSFER/ LIME KILN/ VERTICAL DESIGN/

AB: Svedala Industria Pyro Division (SIPD) produces recuperation lime kilns that are claimed to be more efficient than conventional lime kilns. This is because the cooling coil in conventional lime kilns are frequently subjected to an overcharge. The cooling system utilised in SIPD's kilns come with a unified internal design that allows a larger

heat recovery, with smaller charges applied to the support of the kiln's discharge. The Verti-Reactor System by SIPD can be put in the place of a conventional kiln, occupying only 25% of its interior, and the SIPD kiln itself is more compact. (6 fig, 1 tab)  
SO: B

00005

PI: 20203928 JA: 0203

TI: The RDH process at Celulose Arauco y Constitucion

AU: Munoz H J; Mesa P J

JN: Celul. Pap. (Chile) \$IS=0716-2308

CI: vol. 16, no. 1, Mar. 2000, pp 21-26, 28-31 (C, K, P, S)

CT: CASE STUDY/ KRAFT MILL/ KRAFT PULPING/ MILL DESCRIPTION/ RAPID DISPLACEMENT HEATING/ RDH/

CN: Celulosa Arauco y Constitucion

AB: A case study outlines the implementation of the Beloit's Rapid Displacement Heating (RDH) process in the pulp plant of Celulosa Arauco y Constitucion, Chile. The RDH process is claimed to be an economical alternative to conventional kraft process as the liquors are utilised to produce energy, and the energy of each batch is stored to be used in the following one. The black liquor consumes a certain amount of alkali, and because the charges of these tended to vary, an analyser of the effective alkali was placed in the line. The presence of calcium in the black liquor required an adaptation that involved increasing the temperature of the liquor. In addition, to improve the physical and mechanical properties of the pulp, an excess of 4MW of energy was produced. (4 fig, 7 tab)

SO: B

00006

PI: 20203964 JA: 0203

TI: Biotechnologies for kraft pulp production: results of experiences in Chile and future perspectives

AU: Gonzalez Molina J

CI: 54th ATIP Annual meeting "Water, energy, waste: issues of the paper industry", Grenoble, France, 9-11 Oct. 2001, session 1, 5pp <Paris, France: Association Technique de l'Industrie Papetiere, 2001, 461pp, 3 vols, FRF1000.00> (C)

CT: BIOPULPING/ CONFERENCE/ DELIGNIFICATION/ KRAFT PULPING/ MECHANICAL PROPERTIES/ PINUS RADIATA/ PLEUROTUS/ PRETREATMENT/ YIELD/

CN: ATIP

AB: The influence of the white rot fungus *Pleurotus* sp. that acts on logs of *Pinus radiata* on pulp physical properties was investigated. Two treatments were made at 75% wood humidity, one with the fungus and another as control. Pulp characteristics evaluated included yields, kappa index and viscosity. Following delignification with oxygen, there was a C/D-Eo-D-Ep-D bleaching sequence. Tensile energy, tear index and tensile energy absorption (TEA) were determined. *Pleurotus* sp. was found to have an active delignification action and, compared with the control, leaves more residual hemicellulose. *Pleurotus* sp for kraft biopulping results in higher yields, lower kappa index and higher degree of polymerisation in the fibre cellulose. The bleaching process is also more economic for biopulps, using less chlorine products and with higher final yields in the process, with better degrees of brightness. The properties of paper from pulps of

wood treated with white rot fungus were better than the control. (4 tab, 21 ref)

SO: B

00007

PI: 20203965 JA: 0203

TI: New BCTMP grades for quality improvement and cost reduction of paper machine furnishes

AU: Burkhart H; Pelech B; Munster H

CI: 54th ATIP Annual meeting "Water, energy, waste: issues of the paper industry", Grenoble, France, 9-11 Oct. 2001, session 1, 19pp <Paris, France: Association Technique de l'Industrie Papetiere, 2001, 461pp, 3 vols, FRF1000.00> (C)

CT: ALKALINE PEROXIDE MECHANICAL PULP/ ALKALINE PEROXIDE MECHANICAL PULPING/ BLEACHED PULP/ CHEMITHERMOMECHANICAL PULP/ CONFERENCE/ COST/ CTMP/ NEW PROCESS/ PAPER PROPERTIES/ PULP PROPERTIES/ WOOD CONTAINING PAPER/

CN: ATIP

AB: Process improvements have been made to the original bleached chemithermomechanical pulping (BCTMP) process which uses sodium sulphite impregnation of softwood and alkaline sodium sulphite, pretreatment of hardwoods. In the alkaline peroxide mechanical pulping process (APMP), the chips are washed and pre-steamed and subsequently impregnated with complexing agents, hydrogen peroxide and sodium hydroxide in one or two stages. This impregnation means the material is prebleached and the wood structure is alkali swelled, reducing the energy demand for refining. The latest development is the P-RC APMP process, in which the pulps are further impregnated with hydrogen peroxide and sodium hydroxide. The P-RC APMP pulps produced in a pilot plant have demonstrated superior strength/bulk/light scattering relationships and surface properties compared to conventional BCTMP. Although not yet available as market pulps, an integrated plant is under construction and market pulp mills are in the planning stage. (21 fig, 3 ref)

SO: B

00008

PI: 20203985 JA: 0203

TI: Kraft process today and tomorrow. Part 3: the influence of cooking conditions on pulp structure and bleachability

AU: Oblak-Rainer M

JN: Papir \$IS=0350-6614

CI: vol. 29, no. 3-4, Sept. 2001, pp 55-62 (K)

CT: BLEACHABILITY/ COOKING CONDITION/ KRAFT PULP/ PULP PROPERTIES/ RESIDUAL LIGNIN/ TCF BLEACHING/ TOTAL CHLORINE FREE BLEACHING/

AB: The latest investigations regarding bleachable kraft pulp manufacture are reviewed, including factors, especially cooking parameters, with significant influence on further total chlorine free (TCF) bleaching. Endeavours to correlate the chemical structure of residual lignin with bleaching response have given equivocal results. A high beta-aryl ether linkages content in the unbleached residual lignin after cooking has recently been found to contribute to a better bleachability of pulp. (4 tab, 56 ref)

SO: B

00009

PI: 20204001 JA: 0203

TI: Removal of manganese from pulp fibres with magnesium sulphate in a displacement system (Extended Abstract)

AU: Li Z; Ni Y; van Heiningen A R P

JN: Solutions!

CI: Dec. 2001, pp 39 (C, K, P, S)

CT: DISPLACEMENT WASHING/ ION EXCHANGE/ MAGNESIUM SULPHATE/ MANGANESE/ PULP WASHING/

AB: Removal of manganese from pulp fibres is usually attained in a chelation stage with diethylenetriaminepentaacetic acid (DTPA) or ethylenediaminetetraacetic acid (EDTA), although it can also be performed in a treatment with magnesium sulphate via the ion exchange technique. Ion exchange experiments were conducted on a thermomechanical pulp (TMP) using a displacement washing cell with varying concentrations of magnesium sulphate. The results were compared with experiments conducted in a static system. Peroxide bleaching experiments on the ion exchanged pulps were conducted. With a magnesium sulphate charge of 1%, a residual manganese content of around 5ppm could be reached from a pulp containing 150ppm manganese. Due to the efficient removal of manganese of the resulting pulp by the ion exchange process in a displacement system, bleaching in a peroxide stage yielded comparable results as those from DTPA chelated pulp. (4 fig, 4 tab, 11 ref) (Full text available from Tappi only)

SO: B

00010

PI: 20204005 JA: 0203

TI: Soda-AQ pulping of softwood: a literature survey

AU: Hakansdotter L

CI: KAM-rapport A23, Stockholm, Sweden: STFI Swedish Pulp and Paper Research Institute, July 1999, 24 pp (S)

CT: ANTHRAHYDROQUINONE/ BLEACHING/ OXYGEN DELIGNIFICATION/ SODA PULPING/ SOFTWOOD/ SOFTWOOD PULP/

AB: The soda-anthraquinone process is slower than kraft pulping and requires higher alkali charges or higher temperature to reach a given kappa number in a specific time. Anthraquinone oxidises the reducing end-groups of the carbohydrates leading to less peeling and a higher pulp yield than in a regular soda or kraft cook. The tear strength of soda-anthraquinone pulp is lower than that of kraft pulp, and this could be due to the higher yield and/or the higher hemicellulose content. Soda-anthraquinone pulp is as responsive to oxygen delignification as kraft pulp, and using hydrogen peroxide, can be bleached to the same brightness. The hydrogen peroxide residuals, however, are high and to reach the same brightness a higher charge is needed. An alternative to raising the charge may be to raise the temperature in the hydrogen peroxide stage. Two paths for the reactions of lignin and carbohydrate have been proposed, an ionic mechanism and a radical mechanism, both occurring via a quinone methide intermediate. (7 fig, 58 ref)

SO: B

00011

PI: 20204014 JA: 0203

TI: Better analysis of carbohydrates gives the possibility to calculate pulp yield

AU: Brannvall E

JN: Nord. Papp. Massa

CI: no. 5, 2001, pp 37-38 (K, S)

CT: CARBOHYDRATE/ COOKING/ ENZYME/ HYDROLYSIS/ LIGNIN/ MANNAN/ YIELD/

CN: Norwegian University of Science and Technology

AB: Carbohydrate profiles are studied at the Norwegian University of Science and Technology, Norges Teknisk-Naturvetenskapliga Universitet, which is the country's second largest university with 20,000 pupils, 74 institutions and 11 faculties. The institution of chemical process technology comprises a department for pulp and paper with close co-operation with PFI, the Norwegian paper industry's research institute. Analyses show that it is not until after several months of continuous cooking at a pulp mill when reliable figures for the consumption of wood and output of pulp can be given. It has been established that enzymatic hydrolysis results in improved carbohydrate analysis. Changes of process are not adequate to arrive at increased output; it is necessary to add chemicals which protect the carbohydrates against peeling. Polysulphide and antrachinon are commercially used for this purpose. The carbohydrate output can also be calculated directly from the concentration of mannan in the pulp. The study has previously been presented at Nice at the 11th ISWPC under the title "Carbohydrate profiles of kraft pulps manufactured with white liquor additives" and also at the 3rd Biennial Johan Gullichsen Colloquium under the title "Characterisation of pulp carbohydrates by enzymatic hydrolysis and determination of pulping yield with carbohydrate profiles". (4 fig)

SO: B

00012

PI: 20204099 JA: 0203

TI: Studies on polysulfides cooking (IV): effect of cooking liquor impregnation on PS cooking

AU: Watanabe K; Shimizu M; Nanri Y

CI: 2001 (68th) Pulp and paper research conference, Tokyo, Japan, 18-19 June 2001, pp 62-65, <Tokyo, Japan: Japan TAPPI, 2001, 180pp> (P)

CT: ANTHRAQUINONE/ CONFERENCE/ COOKING/ CRACKING/ POLYSULPHIDE/ WHITE LIQUOR/

CN: Japan TAPPI

AB: Polysulphide (PS) is produced from sodium sulphide in white liquor (WL) and PS cooking is used to increase pulp yield. Too much PS generation could result in a lack of sulphidity. Occasionally, high liquor/wood ratio results in low sodium sulphide levels but this can be remedied by the addition of anthraquinone. The wasting of sodium sulphide can also be prevented by using the WL electrolytic method for PS cooking. It is necessary to ensure sufficient impregnation to improve yield with PS. PS needs to be distributed evenly onto wood chips prior to the cooking reaction as PS is unstable at high temperatures. The cracking treatment of woodchips is particularly effective for low permeability wood chips for PS cooking without impregnation. (6 fig)

SO: B

00013

PI: 20204100 JA: 0203

TI: Behaviour of hexenuronic acid during Kraft pulping: the relation between cooking conditions and formation of hexenuronic acids

AU: Kawamura A

CI: 2001 (68th) Pulp and paper research conference, Tokyo, Japan, 18-19 June 2001, pp 66-69, <Tokyo, Japan: Japan TAPPI, 2001, 180pp> (P)

CT: ACID/ CONFERENCE/ COOKING/ PROBLEM SOLVING/ PULP/ SCALE/ TRANSITION METAL/

AB: Reacting with and consuming various bleaching chemicals including chlorine, chlorine dioxide, ozone and peracids, hexenuronic acid (HexA) groups are linked to the increase of transition metal content problems associated with pulp and scale. These unsaturated acids are produced during kraft pulping when a proportion are either dissolved or degraded. Using Vuorinen's selective hydrolysis and analysis by high performance liquid chromatography (HPLC), HexA in the pulps was quantified. 10 m mol/kg of HexA contributes 1.45 units to the Kappa number. Using this as a basis, the HexA content of hardwood pulps produced from various cooking conditions in the laboratory were monitored. (1 fig, 6 ref)

SO: B

00014

PI: 20204557 JA: 0203

TI: CCD-camera makes the control of recovery boiler easier

AU: Kinnunen L

JN: Energia \$IS=0781-9463

CI: vol. 17, no. 8, 2001, p. 46 (K)

CT: CCD CAMERA/ ONLINE CONTROL/ RECOVERY FURNACE/

CN: Fortum; Multitec Finland Oy

AB: The camera is intended for recovery furnaces and is able to withstand the demanding conditions at least twice as long as conventional charge coupled device (CCD) cameras. The development was carried out at Finnish company Fortum, and the marketing and supply of the camera system is handled by Multitec Finland Oy. The first camera of this type was installed in 1999 at Sunila pulp mill near Kotka owned by Myllykoski Oy and Stora Enso. The mill has two medium sized furnaces producing about 2,000tpd black liquor. The produced energy exceeds the requirements of the installaton. The camera produces images according to which the operation of the furnace can be adjusted to ensure cost effective running of the mill and low emissions in the air.

SO: B

00015

PI: 20204594 JA: 0203

TI: A new process of producing highly concentrated polysulphide liquor through electrolysis of white liquor

AU: Watanabe K

JN: Papel \$IS=

CI: vol. 62, no. 7, supplement TAPPI J, July 2001, pp 5-15 (C, K, S)

CT: CONCENTRATION/ ELECTROLYSIS/ KAPPA NUMBER/ MODIFIED KRAFT PROCESS/ NEW PROCESS/ POLYSULPHIDE/ WHITE LIQUOR/ YIELD/

AB: Three Japanese pulp companies have pooled resources and come up with a new process of electrolytic oxidation aimed to make concentrated polysulphide sludge (PS) and purified sodium hydroxide from the white liquor. The new technique allows the amount of sulphide to be constant during the kraft pulping process by preventing the formation of sulphide and allowing a high concentration of PS from the white liquor. The laboratory tests showed that besides increasing pulp yield the process is also effective in reducing the kappa number. (9 fig, 1 tab, 15 ref)

SO: B

00016

PI: 20204595 JA: 0203

TI: New concept of use of dispersed air in washing of unbleached pulp

AU: Wang J

JN: Papel \$IS=

CI: vol. 62, no. 7, supplement TAPPI J, July 2001, pp 16-21 (C, K, S)

CT: AIR/ BROWN STOCK/ DISPERSION/ UNBLEACHED PULP/ WASHING/

AB: To investigate what happens during the washing of unbleached pulp, an experiment involving a washing cell was devised to visualise the formation of pulp during the washing process. It was observed that in the absence of brown stock or by using an anti-foaming agent, large air bubbles would emerge from the fibres, leaving channel tracks behind, without influencing the water flow. A possibility was raised that such channels could be linked to the lower efficiency of certain washing technologies. (4 fig, 13 ref)

SO: B

00017

PI: 20204609 JA: 0203

TI: Melbar and Cambara: successful partnership allows the use of lignin residues from pulp production in a new product

AU: Mercante Savastano R

JN: Papel \$IS=

CI: vol. 62, no. 10, Oct. 2001, p. 75 (C, K, S)

CT: BYPRODUCT/ LIGNOSULPHONATE/ REUSE/ SPENT SULPHITE LIQUOR/

CN: Cambara; Melbar

AB: A ground breaking partnership has been formed between two Brazilian companies located in the state of Rio Grande do Sul. These are Cambara Produtos Florestais, manufacturer of fluff pulp, and Melbar, a manufacturer of a variety of products for the construction industry and of dyes, fire extinguishers and agrochemicals. Now Cambara is supplying its black liquor to Melbar, which uses it to manufacture lignosulphates. (2 fig) (Short article)

SO: B

00018

PI: 20204619 JA: 0203

TI: Rapid Displacement Heating (RDH) kraft pulping and ECF bleaching of Brazilian Eucalyptus urograndis. Part 1

AU: Sezgi U S

JN: Celul. Pap. (Chile) \$IS=0716-2308

CI: vol. 14, no. 4, Oct. 1998, pp 4-6, 8-15 (C, K, P, S)

CT: CHEMICAL CONSUMPTION/ COST/ DISPLACEMENT PULPING/ ECF BLEACHING/ ELEMENTAL CHLORINE FREE BLEACHING/ EUCALYPTUS/ KAPPA NUMBER/ KRAFT PULP/ KRAFT PULPING/ OXYGEN DELIGNIFICATION/ PULP PROPERTIES/ RAPID DISPLACEMENT HEATING/ RDH/ WASHING/ YIELD/

AB: Optimising all stages of the pulp making process is even more important when applying environment friendly technologies such as the energy efficient Rapid Displacement Heating (RDH) pulping and elemental chlorine free (ECF) bleaching. A comparative study between RDH and conventional processes was carried out to study the pulp yield and the kappa number of pulp made from Brazilian grown Eucalyptus urograndis. RDH improves the brown stock yield by submitting the chips to two pretreatments of warm and hot fill previous to cooking, rendering the early cooking stage with low hydroxide and high hydrosulphite. The ECF bleaching reduces the amount of chlorine dioxide allowing up to 90% ISO brightness. Z-ECF sequences are also significantly reduced as the kappa numbers get near 12, although maintaining them between 16 and 20 is the most cost effective way. (10 fig, 2 tab, 6 ref)

SO: B

00019

PI: 20204623 JA: 0203

TI: A new technology of causticising opens new possibilities for Aracruz

AU: Nordlander A

JN: Celul. Pap. (Chile) \$IS=0716-2308

CI: vol. 14, no. 5, Dec. 1998, pp 31-33 (C, K, P, S)

CT: CAUSTICISING/ FILTRATION/ GREEN LIQUOR/ NEW TECHNOLOGY/ PILOT PLANT/

CN: Aracruz Cellulose SA

AB: Over the years Aracruz, Brazil, has managed to increase its capacity while at the same time advancing in environment friendly technologies. First it managed to reduce its water consumption from 68 to 45cu m/t. In 1994 a plant was introduced to filter the green liquor from the recovery boiler using a new causticising technology introduced by Kvaerner Pulping. The new causticising plant has not only increased Aracruz capacity but also managed to eliminate a large part of the metals and other unprocessed substances, leading to a reduction in the consumption of peroxide in the total chlorine free (TCF) bleaching process. Aracruz is very happy with the environmental solutions offered by Kvaerner. (2 fig)

SO: B

00020

PI: 20204637 JA: 0203

TI: Recent fibre research findings

AU: Heikkurinen A

JN: KCL tiedotta KCL Inf. \$IS=0359-0704

CI: no. 2, 2001, pp 4-5 (C, K, P, S)

CT: DEFIBRATION/ FRACTIONATION/ GROUNDWOOD/ MEASUREMENT/ MECHANICAL PULPING/ MEETING/ REFINING/ THERMOMECHANICAL PULP/ TMP/

AB: Recent fibre research findings were presented at the International Mechanical Pulping Conference (IMPC), the theme of which was "Mechanical Pulp - Added Value for Paper and Board". One of the papers presented examined the synergistic benefits to be obtained from a mixture of stone groundwood and thermomechanical pulp (TMP) in the manufacture of supercalandered (SC) paper. Another paper examined both short and long term challenges in the field of research, while a further work examined the development of summer- and springwood fibres by processing summer- and springwood-containing chips made from peeled veneer mats. A paper presented on the manufacture of SC and lightweight coated (LWC) paper making pulp with large conical refiners was based on the idea that pulp can be most economically produced with large refiners based on a three-stage design. Another paper presented a design concept based on the idea that after the first refining stage a large part of the fibre raw material is already suitable for paper making. Interesting measurement data were presented from research concerning the porosity of the wood fibre cell wall and its increase during mechanical refining.

SO: B