Carboxyl Groups in Some Wood Species

Species	Methylglucuronic acid content (mmol/100g)	Total Carboxylic acid content (mmol/100g)
Picea abies	7	15-25
Pinus sylvestris	8	15
Betula Verrucosa/pubesens	15	25-35

Bulk Carboxylic Acid Group Content of Various Wood Pulps

Pulp sample	Carboxylic acid group content (mmol/100 g o.d. pulp)
Unbleached TMP	8.0-11.0
Bleached TMP (H_2O_2)	15.0-22.0
Unbleached CTMP	8.0-11.0
Bleached CTMP (H_2O_2)	15.0-25.0
Unbleached sulfate (kappa # <32)	6.0-8.0
Unbleached sulphite (kappa # <32)	5.0-6.0
Bleached sulphate	1.0-2.5

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Fiber charge for softwood kraft pulp through ECF bleaching

Pulp after bleaching	Total acid content (μeq/g)
Kraft pulp	9.7
O	10.2
OZ	6.0
OZE	5.4
OZEP	5.4
OD	6.1
ODE	5.6
ODED	5.4
ODEDE	5.4
ODEDED	4.6

Surface/Total Charge for ECF/TCF Bleached Kraft Pulps

Pulp sample	Total charge (μeq/g)	Surface charge (μeq/g)	Charge ratio* (%)
ECF HW(DEPPDD)	55	7	12.7
TCF HW(OOQPO)	119	16	13.4
TCF HW(OOQQPO)	152	17	11.2
TCF SW(OOQQPO)	68	11	16.2

*Charge ratio=surface charge/ total charge

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Fiber charge for Softwood Kraft Pulp through ECF bleaching

Pulp	Fiber charge (mmol/100 g o.d. pulp)
Unbleached	12.3
O	11.3
OD(EO)	8.6
O(DZ)(EO)	7.4
OZ(EO)	7.6
OD(EO)DED	5.1
O(DZ)(EO)DED	4.9
OD(EO)Q(PO)	7.3
O(DZ)(EO)Q(PO)	6.8

	Brightness	Carboxylic acid content (µmol/g)
DEDED	87.8	41.1
D(EPO)DED	88.0	38.5
(D+C)EDED	87.4	35.9
(D+C)(EO)DED	88.2	32.9
OD(EPO)DD	87.1	32.3
OD(EPO)DP	88.1	39.2

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