Kraft White Liquor: TTA, Active and Effective Alkali, Sulfidity

Total titratable, active and effective alkali, activity, causticity and sulfidity of kraft white liquor from NaOH, Na_2S and Na_2CO_3 (all as Na_2O), by Smook Table 7-1.

Method: Smook; Handbook for Pulp & Paper Technologists; ...

Input parameters

Unit system: SI

Parameter	Value	Unit
NaOH (as Na_2O)	85.000	g/L
Na_2S (as Na_2O)	32.000	g/L
Na_2CO_3 (as Na_2O)	20.000	g/L

Calculated results

Parameter	Value	Unit
Total titratable alkali	137.00	g/L
Active alkali	117.00	g/L
Effective alkali	101.00	g/L
Activity	85.401	%
Causticity NaOH/(NaOH + Na_2CO_3)	80.952	%
Sulfidity on active alkali	27.350	%
Sulfidity on TTA	23.358	%

Notes for this case

- State the basis of sulfidity (AA or TTA) every time; mills keep it near 25–35 % on AA.

Formula and method

$$TTA = NaOH + Na_2S + Na_2CO_3, \quad AA = NaOH + Na_2S, \quad EA = NaOH + \frac{1}{2}Na_2S$$

$$S_{AA} = \frac{Na_2S}{AA}, \quad \text{causticity} = \frac{NaOH}{NaOH + Na_2CO_3}$$

Variables

$NaOH$	NaOH (as Na_2O)	kg/m³
Na_2S	Na_2S (as Na_2O)	kg/m³
Na_2CO_3	Na_2CO_3 (as Na_2O)	kg/m³
TTA	Total titratable alkali	kg/m³
AA	Active alkali	kg/m³
EA	Effective alkali	kg/m³
AA/TTA	Activity	-
causticity	Causticity NaOH/(NaOH + Na_2CO_3)	-
S_{AA}	Sulfidity on active alkali	-
S_{TTA}	Sulfidity on TTA	-

Method and standards

Smook's Table 7-1 definitions.

Assumptions and limits

- All components as Na_2O.

References

- Smook
- Handbook for Pulp & Paper Technologists
- 3rd ed. (Angus Wilde, 2002)
- ch. 7
- Table 7-1 (kraft liquor terms)

Report details

Report reference	FCC-QCF8-GPJF (the same inputs always give the same reference)
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Release checks	2 reference cases of this calculator, computed independently, are checked on every release

Results are for engineering estimation. Verify critical designs against the referenced standards and your own data.

This calculator online

https://calc.firecad.com/chemical/pulp-paper/kraft-white-liquor-analysis

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Reopens the calculator with the inputs of this report.