W1.42

Quality Control Formulae
basic equations

1 Total Carbonates

total carbonates are normally determined by acid-alkali titration.They can also be calculated from raw analysis unignited as

Total carbonates	TC	%	TC = 1.784CaO + 2.09MgO
calcium oxide	CaO	%	
magnesium oxide	MgO	%	

2 Total alkalies expressed as Na_2O

$Na_2O = Na_2O + 0.658K_2O$

sodium oxide	Na_2O	%
potassium oxide	K_2O	%

3 Conversion of raw analysis to loss free basis all by weight

$Of = Or*100/(100-L)$

% oxide raw basis	Or	%
% oxide loss free basis	Of	%
loss on iginition	L	%

4 Conversion of kiln dust to kiln feed

wt. of dust in terms of feed	we
wt. of actual dust	wd
% ignition loss dust	Ld
% ignition loss kiln feed	Lf

Dust collected in dust collector shows a differentl.o.i. as compared to l.o.i. of kiln feed because it is partially calcined.The following formula helps to find wt. of dust in terms of wt. of kiln feed.

$we = (wd)(1-Ld)/(1-Lf)$

5 Calculation of total carbonates from acid alkali titration
useful only when MgO content is known

$CaCO_3$=1.668(**a**-1.489MgO)

apparent total lime by titration		$MgCO_3$ = 2.098MgO
Total carbonates	TC	TC = $CaCO_3$ + $MgCO_3$
		CaO = 0.935(a-1.489MgO)

a is apparent total lime content from titration

6 % Calcination

apparent % calcination	C	C = (fi-di)*100/fi
ignition loss original feed	fi	
ignition loss sample	di	

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