

SALT BALANCE		CALCULA- TIONS		SALTS		SALT BALANCE		CALCULA- TIONS		FINAL	FINAL
<u>SAMPLE-[A]</u>	{A}	{A}	{A}	SOLUBILITY ON	<u>SAMPLE-[B]</u>	{B}	[B]	{B}	RESULTS	RESULTS	
ANALYTICAL	To Fill		RESULTS	PPM / % BASIS	ANALYTICAL	To Fill		RESULTS	OF	OF	
<u>RESULTS</u>	ppm	SALTS	IN	AT 50 DEG	<u>RESULTS</u>	PPM	SALTS	IN	SAMPLE-	SAMPLE	
<u>when TH > M</u>		CONSIDERED	PPM	CENT.	<u>when M > TH</u>		CONSIDERED	PPM.	{A}	{B}	
pH	7.3	Ca(OH)2		1210 ppm	pH	7.3	Ca(OH)2				
P alk.	nil	CaCO3		7.7 ppm	P. alk.	nil	CaCO3				
M.alk	47	Ca(HCO3)2	45.36	17.50%	M.alk.	70	Ca(HCO3)2	64.8	45.36	64.8	
TH.	54	CaCl2		137%	TH.	66	CaCl2				
CaH.	28	CaSO4		2440 ppm	CaH.	40	CaSO4				
MgH.	26	Ca3(PO4)2		20 ppm	Mg.H.	26	Ca3(PO4)2				
Chloride	35	CaSiO3		100 ppm	Chloride	40	CaSiO3				
Sulphate	traces	Mg(OH)2		9.6 ppm	Sulphate	65.8	Mg(OH)2				
		Mg(HCO3)2	27.74	decompose			Mg(HCO3)2	37.96	27.74	37.96	
Nitrate	0	MgCl2	6.65	61%	Nitrate	0	MgCl2		6.65		
		MgSO4		59.20%			MgSO4				
ortho Phosphate	5	Mg3(PO4)2		2.58 ppm	Phosphate	0	Mg3(PO4)2				
Total Phosphate	40.194	MgSiO3		390 ppm			MgSiO3				
Silica	19.8				Silica	21.4					
		NaHCO3		soluble	Na2SiO3	43.51	NaHCO3	6.72		6.72	
Sodium Silicate	40.19	NaCl	49.48606	soluble	Nitrite.		NaCl	65.91549	49.4861	65.91549	
		Na2SO4		59.20%			Na2SO4	97.32917		97.32917	
Nirite	0	Na3PO4			TDS	304.2	Na3PO4				
TDS	186.8	SiO2		120 ppm	Sp.Cond.	456	SiO2				
Sp.Cond.		Na2SiO3					Na2SiO3	43.51		43.51	
		TOTAL	129.2361		Total	316..26		316.2347	129.236	316.2347	

AS	ANALYSED	Eq.Wt.	Molar	Equivalence	IONIC	BALANCE
Total Alkalinity	47	0.02	0.94	HCO3	M ALKALINITY	ANION ANION
Ca. hardness	28	0.02	0.56	Ca(HCO3)2	0.38	Ca 0.56 HCO3 0.94
Mg.Hardness	26	0.02	0.52	Mg(HCO3)2	27.74	Mg 0.52 Cl 0.98592
Chloride	35	35.5	0.985915	MgCl2	0.14	Na 0.845915493 total 1.92592
TOTAL ALKALINITY FACTOR		0.02	0.845915	NaCl	49.48605634	CATION 1.925915493

AS	ANALYSED	Eq.Wt.	Molar	Equivalence	M ALKALINITY	IONIC CATION	BALANCE	ANION	ANION
Total Alkalinity	70	0.02	1.4	HCO3					
Ca. hardness	40	0.02	0.8	Ca(HCO3)2	0.08	Ca		0.8	HCO3
Mg.Hardness	26	0.02	0.52	Mg(HCO3)2	6.56	Mg		0.52	Cl
Chloride	40	35.5	1.126761	NaCl	0.44	Na	0.050833333	total	
Sulphate	65.8	48	1.370833	Na2SO4	101.4416667	CATION	1.370833333		
									1.4
									1.12676
									1.37083
									3.89759

HCO3	MF	0.02			sample-A	steps	when	sample-B	steps	when
CO3	MF	0.02			TH>M			M>TH		
SALT	ANALYSED	RADICAL	SALT	M.F.						
	AS	EQ.WT.	EQ.WT.		[1]pH is 7.3	so	alkalinity	[1]pH is 7.3	so	alkalinity
NaOH	CaCO3	0.02	40	0.8	shall be as	HCO3	form	shall be as	HCO3	form
Ca(OH)2	"	0.02	37	0.74	[2]HCO3 form	of Ca	and then	[2]HCO3 form	of Ca	and
Mg(OH)2	"	0.02	29	0.58	HCO3 form of	Mg shall	be	Mg shall	be taken into	
Na2CO3	"	0.02	53	1.06	converted into	their	molar	molar	equiv.	form
CaCO3	"	0.02	50	1	equivalances	remaining	shall be	and	surplus	M alk.
MgCO3	"	0.02	42	0.84	considered for	Mg		shall be	taken	for
NaHCO3	"	0.02	84	0.84	[3]Cl shall be	taken	for Mg as	Na form as		
Ca(HCO3)2	"	0.02	81	1.62	MgCl2.	then	remaining	NaHCO3.		
Mg(HCO3)2	"	0.02	73	1.46	Chloride shall	be	converted	[3]Cl	then be	taken
NaCl	Cl	35.5	58.5	1.64	into its molar			for	Na	and
CaCl2	Cl	35.5	55.5	1.56	equivalence.	as	NaCl.	converted into	its	
MgCl2	Cl	35.5	47.5	1.34	[4]Silica	shall be	converted	molar	equiv.	form
Na2SO4	SO4	48	71	1.48	into its molar	form	as	[4] them	SO4	shall
CaSO4	SO4	48	68	1.42	Na2SiO3	form	of	also be	taken	for
MgSO4	SO4	48	60	1.25	equivalence.			Na. and	its	molat
NaNO3	NO3	62	85	1.37	[5] for SALT	form	balance	equiv.		
Ca(NO3)2	NO3	62	82	1.32	Anion total	shall be	made	[5] Silica	shall be	taken as
Mg(NO3)2	NO3	62	74	1.19	minus by total	of Ca+Mg	to	Na2SiO3	molar	equiv.
Na2SiO3	SiO2	30	61	2.03	get Na .			[6]Anion	total	of
CaSiO3	SiO2	30	67.5	2.25	salts			HCO3 ,Cl,	SO4	shall
MgSiO3	SiO2	30	59.5	1.98	Cation	plus	Anion	be made	minus	by

Na ₃ PO ₄	PO ₄	95	54.66	0.57	Calcium	Bicarbonate	Ca+Mg	to get	Na.
Ca ₃ (PO ₄) ₂	PO ₄	95	135	1.42	Magnesium	Chloride	Total of	Cation	and
Mg ₃ (PO ₄) ₂	PO ₄	95	131	1.38	Sodium	trace sulphate	Anion	shall be	
NaNO ₂	NO ₂	46	69	1.5	total	total	total	of	Salt
Ca(NO ₂) ₂	NO ₂	46	66	1.43	finally				
Mg(NO ₂) ₂	NO ₂	46	58	1.26	Cation plus	Anion	equal to Salt		