

Adding Gran Alkalinity Method to Mantech Pro

There should already be the hardware for the total alkalinity method on the Mantech system. If not, then please contact your local Mantech Representative.

Here are the steps for adding Gran Alkalinity:

- 1. Add the UDV for Gran Alkalinity. This will be where the result is stored for your final report.
 - a. Go to the Utilities at the top of the main page and open UDV Editor.



b. Add a new UDV for Gran Alkalinity. The name can be long or short-form depending on the spacing on the report.

¢	UDV	Editor				?	×
[Ne	w Delete	Save	Done	User Created UDVs	*	
		UDV #	Value	Description			
	1	1	-1	Gran Alkalinity			

Make the Titration Method for adding the acid to the sample.
 a. Go to Method, then Titration Method.



- b. Load the current Alkalinity Titration Method (you can also make a new titration method from scratch, but it is easier to have some steps pre-loaded).
- c. Save As Gran Alkalinity.



C Titration Method E	Editor - Template: /	Alkalinity Sul	oVersion: 3		? ×
	Load	New	Save	Save As	Done
Template ID And D	escription			×	
Template ID	Gran Alkalinity				
Description					
	Submit		Cancel		

d.

i. Keep the identification page the same, unless the sample volume or titrant being used is different from the Alkalinity Method.

	Identification	Electrodes to Plot	Data Recording Electrodes	Control	Inflection Point Criteria
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Sample Informa	ation				
Name: S	Sample		Kun lable	None	*
			volume column:		
Volume (mL):	10.000	*	Weight (g):	0.000	*
Titrant Informat	tion				
Name:	H2SO4				
Concentration:	0.01982	*	Units:	N	
Titration Specifi	ications				
Titration Curve D	irection:	Down •	Titration Type:	pH	*
			21		
CI 1.1		Allenlinity			-

e. Keep the Electrodes to Plot and Data Recording Electrodes pages the same as well.



Identification Electrodes to Plo	Data Recording Electrodes	Control Inflection Point Criteria	Identification	Electrodes to Plot	Data Recording Electrodes	Control	Inflection Point Criteria
			Electrode	at Port 1			
Primary Electrode to Plot	1	*	Calibration	None	Temp	erature hsation:	None 🔹
Calibration:	PH Calibration	•	Raw m	V Temperatur	e Source: Temperature Prob	e	*
Temperature Compensation:	Automatic	•	Electrode	at Port 2	_		
Temperature Source:	Temperature Probe	•	Calibration	None	- Compe	erature hsation:	None 🔻
Secondary Titration Plots			Raw m	V Temperatur	e Source: Temperature Prob	e	v
Follow titration with pH	olot 💿 Follow	titration with mV plot	Electrode	at Port 3			
O Follow titration with con-	ductivity plot	d titration type only	Calibration:	None	Temp Compe	erature hsation:	None 🔹
Conductivity Probe			Raw m	V Temperatur	e Source: Temperature Prob	e	τ.
Conductivity Meter: COM	4(Conductivity)	•	Electrode	at Port 4			
Calibration: None		•	Calibration	None	Temp Compe	erature nsation:	None 🔹
			Raw m	V Temperatur	e Source: Temperature Prob	e	Υ.
			Temperat	ure To Record			
				Temperatur	e Source: None		Ŧ

f. Adjust the Control page to make the titration go down to pH 3.0. Also don't have the max injection be over 0.1mL as you will want multiple points for the regression analysis. The max injection can also be further lowered if more points are needed.

ld	lentification	Electro	des to Plo	t Data P	Recording	Electrod	les C		Inflection	Point Criteria
	Titure at their									
	l itrant inje	ection								
	Inject to Ta	arget Cor	istant:		-					
	 Injectio 	n Volum	e (∆mL):		(\bullet)	Reading	Chang	e (∆pH)	:	
	0.000		*			0.20		*		
	Volume	Control	(mL)							
	Pre-Inj	jection:	0.000	*		Min Inje	ection:	0.010	4	
	First Inj	jection:	0.010	*	I	Max Inje	ection:	0,100	4	
	Stability C	ontrol						Гуре:	∆pH / ∆Tin	ne 🔻
	Delta									
	∆рН: О).200	‡ Δ	Time (s):	3	*	Timeou	ut (s):	10	r T
	Titration C	topping	Critoria							
	nuration 5	topping	g Criteria			_	- Pron	not for r	ew stoppi	na
		Stopp	oing pH:	3.000	Ŧ		crite	ria durir	g titration	.9
	Max Volun	ne to Inje	ect (mL):	25.000	÷					
	Ma	ax Run Ti	ime (m):	20.000	* *					
		Max En	dpoints:	10	*					



g. The inflection point criteria can be kept the same as well.



- h. Save the Changes
- 3. Set up the Gran Alkalinity Equations
 - a. Go to Method then Equation Editor, and make a New equation set

	Met	hod	Repo	rting	Utilitie	2S	Help				
		Calibr	ation N	/lethoo	Ы	1					
		Titrati	on Me	thod		F					
e		QC Re	gime			atio	on				
		Equat	ion Edi	itor		E					
		Script	s								
6	pri ca	Editor	ALIN	LINIT	N						
	Equation	Lano			Load		New	Save	Sa	ive as	Done
ſ	Equation	n ID Eq	uation	Units	Value		Descript	ion	Equation	s	
		Set ID A	nd Descriptio	n						×	ion
		Set ID		Gran Alkalini	ity						
		Descri	ption								Equation
											ons
				Submit				Cancel			
										Edit Equa	ation
										UDV Ed	itor
l	<							>			



b. Add the following equations:

Equation ID	Equation	Units	Value	D
Gran Alkalinity After Regression	udv1047*tcon*50000/svol	ppm		
Gran Alkalinity Before Regression	udv1046*tcon*50000/svol	ppm		
GVE1	udv1046	mL		
GVE2	udv1047	mL		
Sample Volume	svol	mL		
Titrant Concentration	tcon	N		

×

c. Save the equations.

4. Make the script for the titration and Gran Regression Analysis

- a. Go to Method and Scripts.
- b. Make a new Subscript for performing the Gran Analysis and calculations.

Script	ID And	Description
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C.

Script ID	zSUB Gran Analysis	
Description		
	Submit	Cancel

- d. Select New Sibling for making the script actions.
- e. The first action will be the Gran analysis

¢	Action E	Editor	
	Name:		
	Type:	Timing	•
	Timin	Read Interface	Î.
	Wait	Stirrer	
	0	[Liquid Handling]	[m
	0	Buret Pump/Valve	[m
	0	Change Pump Dire [Method]	[m
		Partial Calibration	
_		QC-Check	
_		Titration	
_		Gran Analysis	
_		Titrate - From Data	
		[Conductivity]	
		Conductivity Meter	
		Conductivity (Mete	
mr	ment	Conductivity Read	Ŧ
air	and Sorie	4	



-Action Editor	-						
Name: Type: Gran Analysis •	Save and Ex	it					
Gran Analysis Titration Type Base With Acid							
 Acid With Base Before E. P. Analysis ✓ Use Before E. P. Analysis No. of Regression Points 5 							
Starting pH	4.000	*					
After E. P. Analysis ✓ Use After E. P. Analysis No. of Regression Points Starting pH	5	*					

- i. Regression points and pH are set by the user.
- f. Calculate Gran Alkalinity depending on whether the endpoint volume is going to be from before the regression or after (change the equation ID).

Action Editor				_ 🗆 🗙		
ame: Type: Change U	DV Value		▼ Sav	e and Exit		
Change UDV Valu	Je					
UDV to Change:	28: Gran Alkalinity	 Action: 	Equation Result	*		
Analysis Station:	1 •					
Equation						
Select	Equation Set Selected I	Equation Set: Gran A	Alkalinity			
Equation ID:	Gran Alkalinity After Regressior	n 🔹 🗸 Show UD	V as Custom Result			
Script			iel Perform Gran Anal	veie		
cript ID: zSUB Gran Analysis		- [Change UDV Value] Store result of Gran Alkalinity After Regression in UDV28 - [Change UDV Value] Store result of Gran Alkalinity After Regression in UDV28 - [Change UDV Value] Store result of Gran Alkalinity After Regression in UDV28 - [Change UDV Value] Store result of Gran Alkalinity After Regression in UDV28 - [Change UDV Value] Store result of Gran Alkalinity After Regression in UDV28 - [Change UDV Value] Store result of Gran Alkalinity After Regression in UDV28 - [Change UDV Value] Store result of Gran Alkalinity After Regression in UDV28 - [Change UDV Value] Store result of Gran Alkalinity After Regression in UDV28 - [Change UDV Value] Store result of Gran Alkalinity After Regression in UDV28 - [Change UDV Value] Store result of Gran Alkalinity After Regression in UDV28 - [Change UDV Value] Store result of Gran Alkalinity After Regression in UDV28 - [Change UDV Value] Store result of Gran Alkalinity After Regression in UDV28 - [Change UDV Value] Store result of Gran Alkalinity After Regression in UDV28 - [Change UDV Value] Store result of Gran Alkalinity After Regression in UDV28 - [Change UDV Value] Store result of Gran Alkalinity After Regression in UDV28 - [Change UDV Value] Store result of Gran Alkalinity After Regression in UDV28 - [Change UDV Value] Store result of Gran Alkalinity After Regression in UDV28 - [Change UDV Value] Store result of Gran Alkalinity After Regression in UDV28 - [Change UDV Value] Store result of Gran Alkalinity After Regression in UDV28 - [Change UDV Value] Store result of Gran Alkalinity After Regression in UDV28 - [Change UDV Value] Store result of Gran Alkalinity After Regression in UDV28 - [Change UDV Value] Store result of Gran Alkalinity After Regression in UDV28 - [Change UDV Value] Store result of Gran Alkalinity After Regression in UDV28 - [Change UDV Value] Store result of Gran Alkalinity After Regression in UDV28 - [Change UDV Value] Store result of Gran Alkalinity After Regression in UDV28 - [Change UDV Value] Store result of Gran Alkalinity After Regression				
Action Selected: none						
New Sibling	New Child					
	rint for the Cro	n Analysia				

- i. Full Subscript for the Gran Analysis.
- g. Save the subscript.
- h. Load the Alkalinity Script. It could also be named pH Alkalinity



Script Editor		Image: Control of the second s
Script Script ID: pH Alk SubVersion: 4 Action Selected: none		 □[F] Sample is First in Table □ [robot] Move to Rack: RACK1 Zone: Tubes Vessel: (next scheduled vessel) □ [Subscript] SUB Sample Aliquot □ [Interface Input] Read Analog Interface Electrode 1(pH Electrode) and store in UDV1002 □ [Interface Input] Read Analog Interface Electrode 1(pH Electrode) and store in UDV1010 □ [Read Temperative] Store tamperative probe reading in in UDV1011
New Sibling	New Child	
Delete Selected	Edit	Subscript Got Anality Equations Subscript Sub Rinse Subscript SUB Rinse
Child to Sibling	Up	🗄 [F] Sample is Last in Table
Sibling to Child	Down	
Edit Method		

i. Save As Gran Alkalinity



j. Edit the Titration step to be with the Gran Alkalinity Titration

New Child Edit	[Titration-Linked] Perfor [Subscript] SUB Alkalin [Stirrer] Set Stirrer 2 to ([Subscript] SUB Piece	m linked Ti The linked Ti ity Equation: 0%	tration Alkalinity Low with bure s	t 192.168.1.50(Alkalinity)
Titration Select Titration	Selected Titration Method:	Gran	Alkalinity	
Buret Name: Analysis Station:	192.168.1.50(Alkalinity)	Ŧ	Edit Titration	
✓ Auto-home Bu	iret for every sample			

- k. Save and click Edit on the SUB Alkalinity Equations.
- I. Change the subscript to be the zSUBGranAnalysis just made.



N	lew Child	[Titration] Perform Titration Gran A [Bubscript] SUB Alkalinity Equation	Ikalinity w
	Edit	[Stirrer] Set Stirrer 2 to 0% ⊕- [Subscript] SUB Rinse	
C Action	Editor		_ □ ×
Name: Type:	Sub-Script	Ţ	Save and Exit
Sub-S	Script elect Script Se	lected Script: zSUB Gran Analysis	

- m. Save Changes.
- 5. You should now be able to add the Gran Alkalinity Script made to your Run Table for running samples.