UV-metric pKa

Sample name: **M13**
Assay name: **UV-metric pKa**
Assay ID: **17I-16011**
Filename: **C:\Sirius_T3\Mehtap\20170915_exp03_uv_M01-M14\17I-16011_M13_UV-metric pKa.t3r**

Experiment start time: **9/16/2017 5:26:27 AM**
Analyst: **Dorothy Levorse**
Instrument ID: **T311053**

Results

pKa 1	**5.79**
RMSD	**0.004 0.002**
Chi squared	**0.0174**
PCA calculated number of pKas	**4**
Average ionic strength	**0.158 M**
Average temperature	**24.9°C**
Analyte concentration range	**90.1 µM to 81.3 µM**
Number of pKas source	**Manual (1)**
Wavelength clipping	**230.0 nm to 450.0 nm**
pH clipping	**1.283 to 12.728**

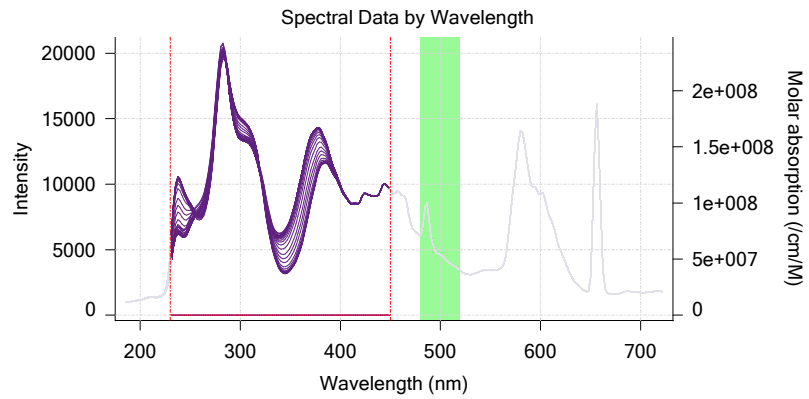
Warnings and errors

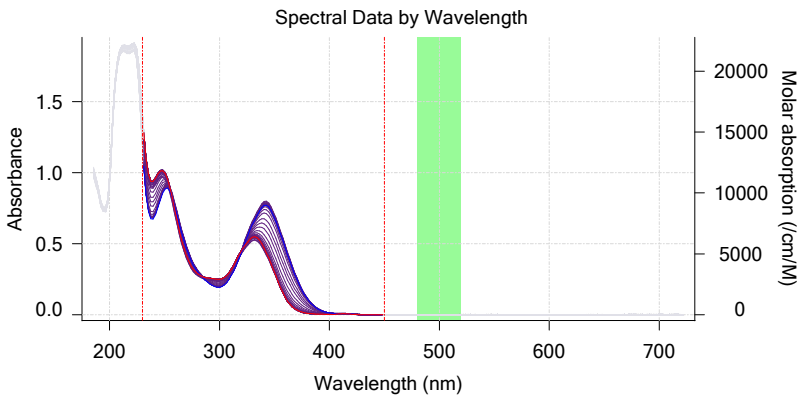
Errors None
Warnings PCA calculation disagrees with predicted number of pKas

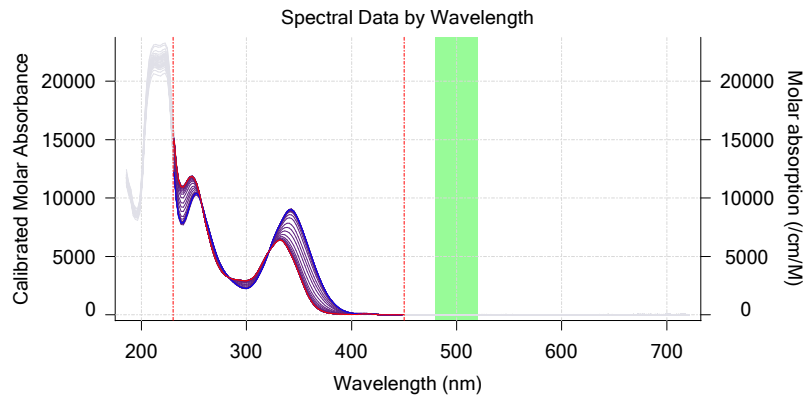
Assay Settings

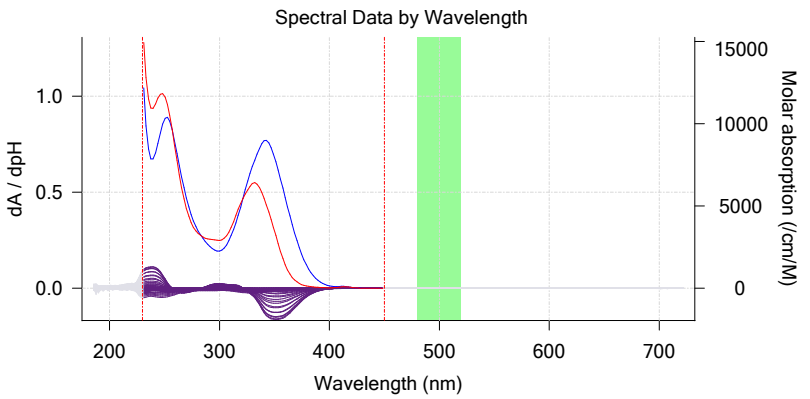
Setting	Value	Original Value	Date/Time changed	Imported from
Buffer in use	Yes			
Buffer type	Phosphate Buffer			
Assay Medium				
Volume of buffer introduced	0.025000 mL			
Add buffer manually	Manual			

Graphs









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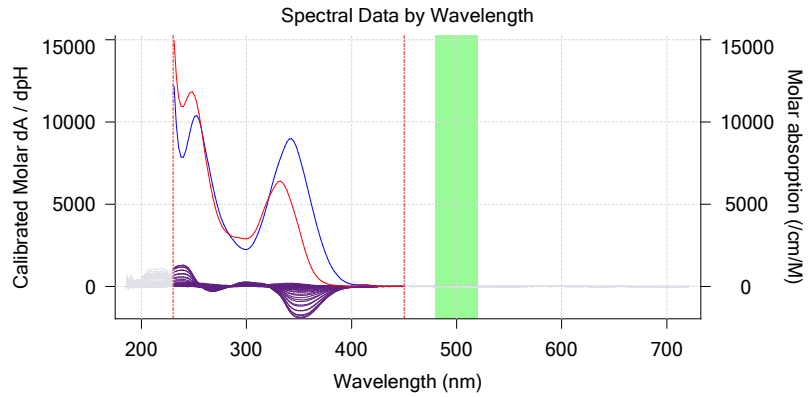
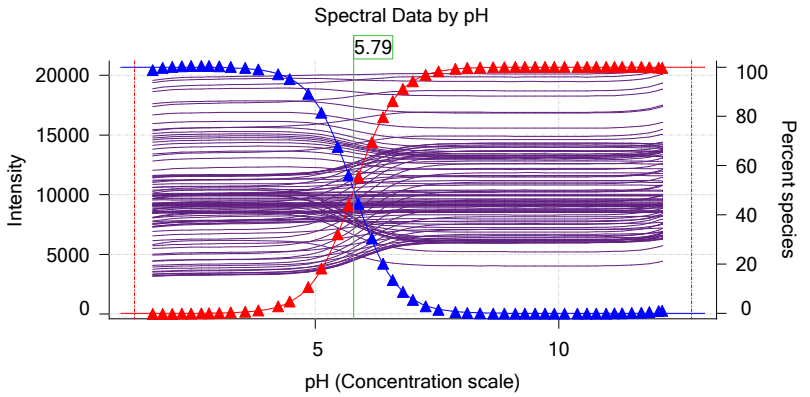
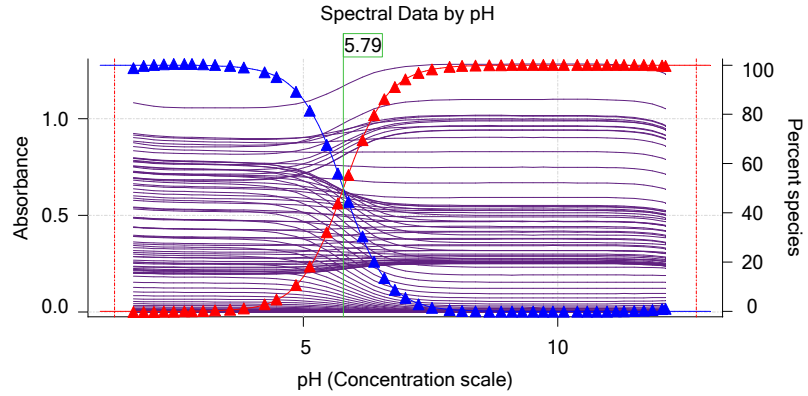
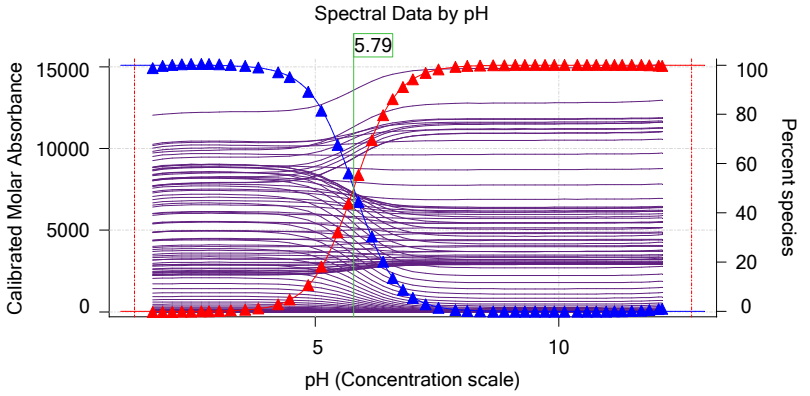
Analyst: **Dorothy Levorse**
Instrument ID: **T311053**

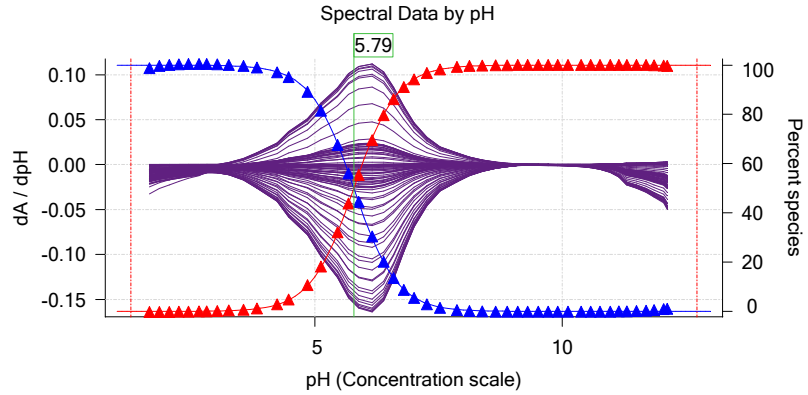
Graphs (continued)

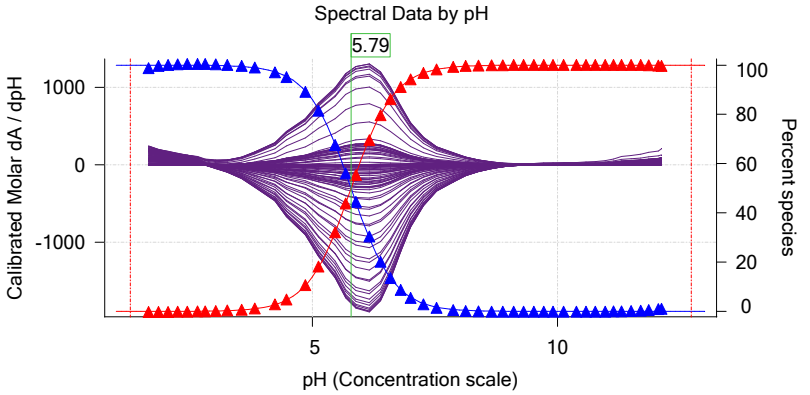


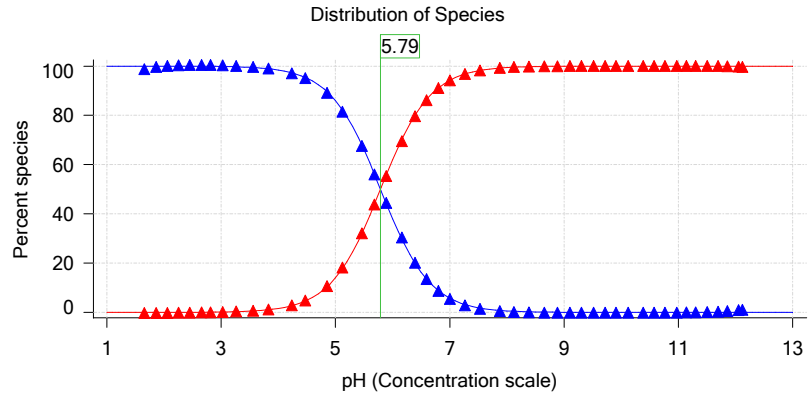


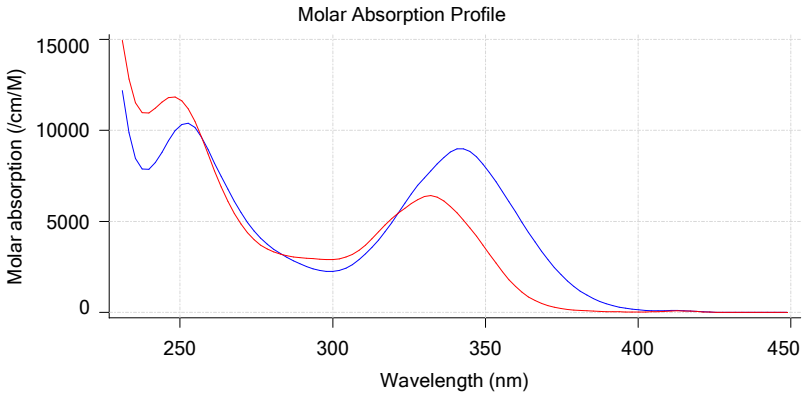












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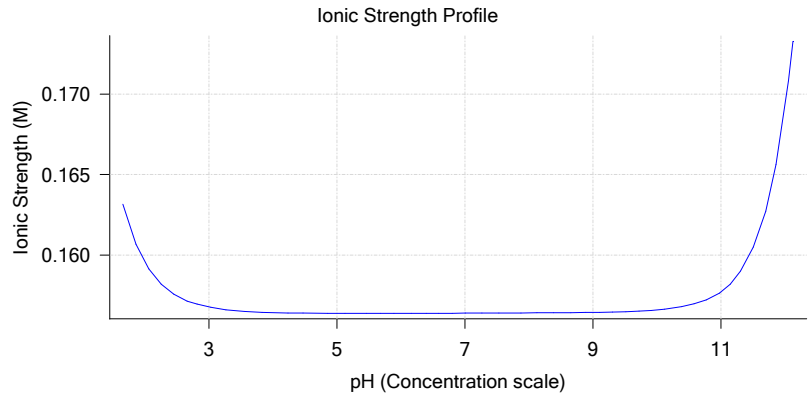
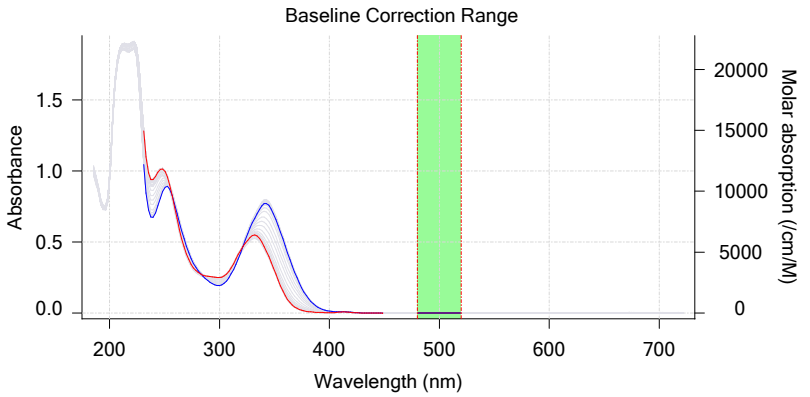
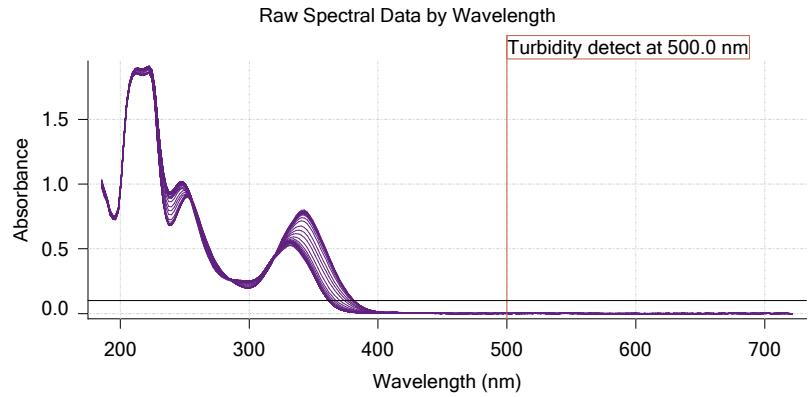
Analyst: **Dorothy Levorse**
Instrument ID: **T311053**

Graphs (continued)







Events

Time	Event	Water	Acid	Base	Buffer	pH	dpH/dt	pH R-squared	pH SD
3:13.4	Dark spectrum								
3:14.9	Reference spectrum								
3:42.5	Volume reset due to vial change								
5:12.8	Initial pH = 7.32								
6:25.9	Data point 4	1.50000 mL	0.07397 mL	0.00000 mL	0.02500 mL	1.783	-0.01315	0.88007	0.0006
6:54.7	Data point 5	1.50000 mL	0.07397 mL	0.02651 mL	0.02500 mL	1.981	0.00191	0.03752	0.0004
7:11.6	Data point 6	1.50000 mL	0.07397 mL	0.04316 mL	0.02500 mL	2.177	-0.00072	0.00137	0.0009
7:28.5	Data point 7	1.50000 mL	0.07397 mL	0.05376 mL	0.02500 mL	2.370	0.00083	0.02459	0.0002
7:45.4	Data point 8	1.50000 mL	0.07397 mL	0.06047 mL	0.02500 mL	2.563	-0.00178	0.06260	0.0003
8:02.0	Data point 9	1.50000 mL	0.07397 mL	0.06482 mL	0.02500 mL	2.771	0.00267	0.20148	0.0002
8:18.6	Data point 10	1.50000 mL	0.07397 mL	0.06752 mL	0.02500 mL	2.926	0.00223	0.15823	0.0002
8:50.7	Data point 11	1.50000 mL	0.07397 mL	0.06978 mL	0.02500 mL	3.143	0.00376	0.44483	0.0002
9:17.5	Data point 12	1.50000 mL	0.07397 mL	0.07079 mL	0.02500 mL	3.377	0.00619	0.63619	0.0003
9:34.1	Data point 13	1.50000 mL	0.07397 mL	0.07150 mL	0.02500 mL	3.669	0.00621	0.67814	0.0003
9:55.8	Data point 14	1.50000 mL	0.07397 mL	0.07197 mL	0.02500 mL	3.941	0.02306	0.96610	0.0011
10:17.5	Data point 15	1.50000 mL	0.07397 mL	0.07230 mL	0.02500 mL	4.349	0.04713	0.96583	0.0023
10:39.3	Data point 16	1.50000 mL	0.07397 mL	0.07246 mL	0.02500 mL	4.585	0.08828	0.95983	0.0044
11:00.9	Data point 17	1.50000 mL	0.07397 mL	0.07258 mL	0.02500 mL	4.967	0.06391	0.97114	0.0032
11:22.5	Data point 18	1.50000 mL	0.07397 mL	0.07265 mL	0.02500 mL	5.238	0.09266	0.98137	0.0046
11:44.2	Data point 19	1.50000 mL	0.07397 mL	0.07274 mL	0.02500 mL	5.576	-0.04558	0.75182	0.0026
12:05.9	Data point 20	1.50000 mL	0.07397 mL	0.07281 mL	0.02500 mL	5.794	-0.00497	0.17640	0.0005
12:27.6	Data point 21	1.50000 mL	0.07397 mL	0.07288 mL	0.02500 mL	6.003	-0.00405	0.10367	0.0006
12:49.3	Data point 22	1.50000 mL	0.07397 mL	0.07300 mL	0.02500 mL	6.276	-0.09344	0.98643	0.0046
13:16.0	Data point 23	1.50000 mL	0.07397 mL	0.07312 mL	0.02500 mL	6.508	-0.00658	0.22559	0.0006
13:42.8	Data point 24	1.50000 mL	0.07397 mL	0.07324 mL	0.02500 mL	6.707	0.00843	0.21212	0.0009
14:14.4	Data point 25	1.50000 mL	0.07397 mL	0.07335 mL	0.02500 mL	6.917	0.03594	0.64534	0.0022

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Experiment start time: **9/16/2017 5:26:27 AM**
Analyst: **Dorothy Levorse**
Instrument ID: **T311053**

Events (continued)

Time	Event	Water	Acid	Base	Buffer	pH	dpH/dt	pH R-squared	pH SD	dpH/dt time
14:46.3	Data point 26	1.50000 mL	0.07397 mL	0.07347 mL	0.02500 mL	7.121	0.05279	0.82814	0.00286	10.0 s
15:23.1	Data point 27	1.50000 mL	0.07397 mL	0.07359 mL	0.02500 mL	7.381	0.08722	0.82731	0.00473	10.5 s
15:55.4	Data point 28	1.50000 mL	0.07397 mL	0.07368 mL	0.02500 mL	7.645	0.08459	0.87181	0.00447	12.5 s
16:29.8	Data point 29	1.50000 mL	0.07397 mL	0.07378 mL	0.02500 mL	7.991	0.07220	0.65617	0.00441	12.5 s
16:59.0	Data point 30	1.50000 mL	0.07397 mL	0.07385 mL	0.02500 mL	8.239	0.08497	0.84683	0.00456	12.5 s
17:28.3	Data point 31	1.50000 mL	0.07397 mL	0.07392 mL	0.02500 mL	8.502	0.08385	0.78179	0.00468	11.5 s
18:01.7	Data point 32	1.50000 mL	0.07397 mL	0.07401 mL	0.02500 mL	8.771	0.08517	0.79772	0.00471	10.0 s
18:33.7	Data point 33	1.50000 mL	0.07397 mL	0.07413 mL	0.02500 mL	9.003	0.06702	0.87686	0.00353	10.0 s
19:05.6	Data point 34	1.50000 mL	0.07397 mL	0.07427 mL	0.02500 mL	9.222	0.03653	0.86980	0.00193	10.0 s
19:32.4	Data point 35	1.50000 mL	0.07397 mL	0.07444 mL	0.02500 mL	9.422	0.03522	0.92320	0.00181	10.0 s
20:04.4	Data point 36	1.50000 mL	0.07397 mL	0.07465 mL	0.02500 mL	9.633	0.02025	0.74869	0.00115	10.0 s
20:31.3	Data point 37	1.50000 mL	0.07397 mL	0.07493 mL	0.02500 mL	9.836	0.00390	0.22436	0.00041	10.0 s
20:58.0	Data point 38	1.50000 mL	0.07397 mL	0.07526 mL	0.02500 mL	10.027	-0.00650	0.58679	0.00042	10.0 s
21:19.8	Data point 39	1.50000 mL	0.07397 mL	0.07568 mL	0.02500 mL	10.238	-0.01224	0.75956	0.00069	10.0 s
21:46.5	Data point 40	1.50000 mL	0.07397 mL	0.07681 mL	0.02500 mL	10.504	-0.01872	0.95526	0.00095	10.0 s
22:18.4	Data point 41	1.50000 mL	0.07397 mL	0.07794 mL	0.02500 mL	10.696	-0.01862	0.94060	0.00095	10.0 s
22:45.3	Data point 42	1.50000 mL	0.07397 mL	0.07921 mL	0.02500 mL	10.886	-0.01340	0.95302	0.00068	10.0 s
23:02.1	Data point 43	1.50000 mL	0.07397 mL	0.08116 mL	0.02500 mL	11.090	-0.01650	0.92034	0.00085	10.0 s
23:18.7	Data point 44	1.50000 mL	0.07397 mL	0.08429 mL	0.02500 mL	11.261	-0.01335	0.93011	0.00068	10.0 s
23:35.4	Data point 45	1.50000 mL	0.07397 mL	0.08895 mL	0.02500 mL	11.422	-0.01591	0.95886	0.00080	10.0 s
24:07.6	Data point 46	1.50000 mL	0.07397 mL	0.09762 mL	0.02500 mL	11.619	-0.00993	0.80207	0.00055	10.0 s
24:34.9	Data point 47	1.50000 mL	0.07397 mL	0.11002 mL	0.02500 mL	11.811	-0.01246	0.85042	0.00067	10.0 s
24:51.9	Data point 48	1.50000 mL	0.07397 mL	0.12728 mL	0.02500 mL	11.973	-0.00741	0.76857	0.00042	10.0 s
25:19.6	Data point 49	1.50000 mL	0.07397 mL	0.15875 mL	0.02500 mL	12.163	-0.00837	0.83967	0.00045	10.0 s
25:41.7	Data point 50	1.50000 mL	0.07397 mL	0.17425 mL	0.02500 mL	12.228	-0.00638	0.50315	0.00044	10.0 s
27:42.1	Assay volumes	1.75000 mL	0.25444 mL	0.17425 mL	0.02500 mL					

Assay Settings

Setting	Value	Original Value	Date/Time changed	Imported from
General Settings				
Analyst name	Dorothy Levorse			
Separate reference vial	Yes			
Standard Experiment Settings				
Number of titrations	1			
Minimum pH	1.800			
Maximum pH	12.200			
pH step between points of	0.200			
Minimum titrant addition	0.00002 mL			
Maximum titrant addition	0.10000 mL			
Argon flow rate	100%			
Start titration using	Cautious pH adjust			
Advanced General Settings				
Detect turbidity using	Spectrometer			
Monitor at a wavelength of	500.0 nm			
Absorbance threshold of	0.100			
Collect turbidity sensor data	No			
Stir after titrant addition for	5 seconds			
For titrant addition, stir at	15%			
Titrant Pre-Dose				
Titrant pre-dose	None			
Assay Medium				
Cosolvent in use	No			
ISA water volume	1.50 mL			
Water added	Automatic			
After water addition, stir for	5 seconds			
At a speed of	15%			
Buffer in use	Yes			

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Instrument ID: **T311053**

Assay Settings (continued)

Setting	Value	Original Value	Date/Time changed	Imported from
Buffer type	Phosphate Buffer			
Volume of buffer introduced	0.025000 mL			
Add buffer manually	Manual			
After medium addition, stir for	5 seconds			
Sample Sonication				
Sonicate	No			
Sample Dissolution				
Perform a dissolution stage	No			
Carbonate purge				
Perform a carbonate purge	No			
Temperature Control				
Wait for temperature	Yes			
Required start temperature	25.0°C			
Acceptable deviation	0.5°C			
Time to wait	60 seconds			
Stir speed of	15%			
Titration 1				
Titrate from	Low to high pH			
Adjust to start pH	Yes			
After pH adjust stir for	10 seconds			
Data Point Stability				
Stir during data point collection	Yes			
For point collection, stir at	15%			
Delay before data point collection	0 seconds			
Number of points to average	20 points			
Time interval between points	0.50 seconds			
Required maximum standard deviation	0.00500 dpH/dt			
Stability timeout after	60 seconds			
Experiment cleanup				
Adjust pH to cleanup	To start pH			
And then stir for	60 seconds			
For cleaning, stir at	20%			
Then add water volume	0.25 mL			
And then stir for	30 seconds			

Calibration Settings

Setting	Value	Date/Time changed	Imported from
Four-Plus alpha	0.112	9/16/2017 5:26:27 AM	C:\Sirius_T3\HCl17I15.t3r
Four-Plus S	1.0006	9/16/2017 5:26:27 AM	C:\Sirius_T3\HCl17I15.t3r
Four-Plus jH	0.7	9/16/2017 5:26:27 AM	C:\Sirius_T3\HCl17I15.t3r
Four-Plus jOH	-0.6	9/16/2017 5:26:27 AM	C:\Sirius_T3\HCl17I15.t3r
Base concentration factor	1.015	9/16/2017 5:26:27 AM	C:\Sirius_T3\KOH17I11.t3r
Acid concentration factor	1.003	9/16/2017 5:26:27 AM	C:\Sirius_T3\HCl17I15.t3r

Instrument Settings

Setting	Value	Batch Id	Install date
Instrument owner	Merck		
Instrument ID	T311053		
Instrument type	T3 Simulator		
Software version	1.1.3.0		
Dispenser module		T3DM1100253	3/31/2009 6:24:52 AM
Dispenser 0	Water		3/31/2009 6:25:05 AM
Syringe volume	2.5 mL		
Firmware version	1.2.1(r2)		
Titrant	Water (0.15 M KCl)	8-18-17	9/8/2017 9:22:43 AM
Dispenser 2	Acid		3/31/2009 6:25:11 AM

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Instrument ID: **T311053**

Instrument Settings (continued)

Setting	Value	Batch Id	Install date
Syringe volume	0.5 mL		
Firmware version	1.2.1(r2)		
Titrant	Acid (0.5 M HCl)	166940	9/8/2017 9:21:27 AM
Dispenser 1	Base		3/31/2009 6:25:21 AM
Syringe volume	0.5 mL		
Firmware version	1.2.1(r2)		
Titrant	Base (0.5 M KOH)	01/06/17	9/8/2017 9:20:03 AM
Dispenser 5	Cosolvent		3/31/2009 6:26:24 AM
Syringe volume	2.5 mL		
Firmware version	1.2.1(r2)		
Distribution valve 5	Distribution Valve		3/31/2009 6:28:19 AM
Firmware version	1.1.3		
Port A	Methanol (80%, 0.15 M KCl)	8-15-17	9/13/2017 12:23:11 PM
Dispenser 3	Buffer		8/3/2010 6:05:16 AM
Syringe volume	0.5 mL		
Firmware version	1.2.1(r2)		
Titrant	Phosphate Buffer		9/12/2017 12:32:29 PM
Dispenser 6	Octanol		10/22/2010 11:52:43 AM
Syringe volume	0.5 mL		
Firmware version	1.2.1(r2)		
Titrant	Octanol	9-14-17	9/14/2017 10:30:38 AM
Titrator		T3TM1100153	3/31/2009 6:24:17 AM
Horizontal axis firmware version	1.17 AI1DI2DO2 Stepper 2		
Vertical axis firmware version	1.17 AI1DI2DO2 Stepper 2		
Chassis I/O firmware version	1.11 AI1DI0DO4 Norgren I/O		
Probe I/O firmware version	1.1.1		
Electrode	T3 Electrode	T3E0769	8/15/2017 10:21:54 AM
E0 calibration	-8.23 mV		9/16/2017 5:26:51 AM
Filling solution	3M KCl	KCL095	9/13/2017 9:16:19 AM
Liquids			
Wash 1	50% IPA:50% Water		9/15/2017 9:38:18 AM
Wash 2	0.5% Trition X-100 in H20		9/15/2017 9:38:22 AM
Buffer position 1	pH7 Wash		9/15/2017 9:38:24 AM
Buffer position 2	pH 7		9/15/2017 9:38:27 AM
Storage position			9/15/2017 9:38:55 AM
Wash water	3.1e+003 mL	9-11-17	9/11/2017 4:28:43 PM
Waste	7.1e+003 mL		9/11/2017 4:28:49 PM
Temperature controller			8/5/2010 7:35:13 AM
Turbidity detector			3/31/2009 6:24:45 AM
Spectrometer		072390	11/23/2010 12:22:28 PM
Dip probe		11086	
Wavelength coefficient A0	185.563		
Wavelength coefficient A1	2.17439		
Wavelength coefficient A2	-0.000285622		
Total lamp lit time	114:03:31		11/23/2010 12:22:28 PM
Calibrated on	9/6/2017 9:33:02 AM		
Integration time	11		
Scans averaged	10		
Autoloader		T3AL1100237	11/10/2015 10:34:13 AM
Left-right axis firmware version	1.17 AI1DI2DO2 Stepper 2		
Front-back axis firmware version	1.17 AI1DI2DO2 Stepper 2		
Vertical axis firmware version	1.17 AI1DI2DO2 Stepper 2		
Chassis I/O firmware version	1.11 AI1DI0DO4 Norgren I/O		
Configuration			
Alternate titration position	Titration position		
Alternate reference position	Reference position		
Maximum standard vial volume	3.50 mL		
Maximum alternate vial volume	25.00 mL		

Sample name: **M13**
Assay name: **UV-metric pKa**
Assay ID: **17I-16011**
Filename: **C:\Sirius_T3\Mehtap\20170915_exp03_uv_M01-M14\17I-16011_M13_UV-metric pKa.t3r**

Experiment start time: **9/16/2017 5:26:27 AM**
Analyst: **Dorothy Levorse**
Instrument ID: **T311053**

Instrument Settings (continued)

Setting	Value	Batch Id	Install date
Automatic action idle period	5 minute(s)		
Titrant tube volume	1.3 mL		
Syringe flush count	3.50		
Flowing wash pump volume	20.0 mL		
Flowing wash stir duration	5 s		
Flowing wash stir speed	30%		
Solvent wash stir duration	5 s		
Solvent wash stir speed	30%		
Surfactant wash stir duration	5 s		
Surfactant wash stir speed	30%		
E0 calibration minimum number of points	10		
E0 calibration maximum standard deviation	0.01500		
E0 calibration timeout period	60 s		
E0 calibration stir duration	5 s		
E0 calibration preparation stir speed	30%		
E0 calibration buffer wash stir duration	5 s		
E0 calibration buffer wash stir speed	30%		
E0 calibration reading stir speed	0%		
Spectrometer calibration stir duration	5 s		
Spectrometer calibration stir speed	30%		
Spectrometer calibration wash pump volume	20.0 mL		
Spectrometer calibration wash stir duration	5 s		
Spectrometer calibration wash stir speed	30%		
Overhead dispense height	10000		

Refinement Settings

Setting	Value	Default value
Turbidity detection method	Spectrometer	Spectrometer
Turbidity wavelength to assess	500.0 nm	500.0 nm
Turbidity maximum absorbance	0.100	0.100
Turbidity probe threshold	50.00	50.00
Exclude turbid points	Yes	Yes
Low intensity warning threshold	100	100
Minimum absorbance change threshold	0.100	0.100
Eigenvector autocorrelation threshold	0.80	0.80
Maximum RMSD severe warning	0.250	0.250
Maximum RMSD warning	0.050	0.050