

**Method:** HCL04 HCL04 **7/25/2012 2:20:48 PM**  
**Start time:** 7/25/2012 2:21:10 PM

### Sample data

| No. | Comment / ID | Start time           | Sample size | Corr. f | Density |
|-----|--------------|----------------------|-------------|---------|---------|
| 1/6 | TRIS         | 7/25/2012 2:21:10 PM | 0.05057 g   | 1.0     | 0 g/mL  |
| 2/6 | TRIS         | 7/25/2012 2:26:07 PM | 0.05016 g   | 1.0     | 0 g/mL  |
| 3/6 | TRIS         | 7/25/2012 2:30:46 PM | 0.05455 g   | 1.0     | 0 g/mL  |
| 4/6 | TRIS         | 7/25/2012 2:35:46 PM | 0.05142 g   | 1.0     | 0 g/mL  |
| 5/6 | TRIS         | 7/25/2012 2:41:03 PM | 0.05187 g   | 1.0     | 0 g/mL  |
| 6/6 | TRIS         | 7/25/2012 2:46:01 PM | 0.05432 g   | 1.0     | 0 g/mL  |

### Results

| No. | Comment / ID | Start time           | Sample size and results |    |            |
|-----|--------------|----------------------|-------------------------|----|------------|
| 1/6 | TRIS         | 7/25/2012 2:21:10 PM | 0.05057 g               |    |            |
|     |              |                      | R1 = 0.98582            | -- | Titer      |
| 2/6 | TRIS         | 7/25/2012 2:26:07 PM | 0.05016 g               |    |            |
|     |              |                      | R1 = 0.98527            | -- | Titer      |
| 3/6 | TRIS         | 7/25/2012 2:30:46 PM | 0.05455 g               |    |            |
|     |              |                      | R1 = 0.98325            | -- | Titer      |
| 4/6 | TRIS         | 7/25/2012 2:35:46 PM | 0.05142 g               |    |            |
|     |              |                      | R1 = 0.98903            | -- | Titer      |
| 5/6 | TRIS         | 7/25/2012 2:41:03 PM | 0.05187 g               |    |            |
|     |              |                      | R1 = 0.98981            | -- | Titer      |
| 6/6 | TRIS         | 7/25/2012 2:46:01 PM | 0.05432 g               |    |            |
|     |              |                      | R1 = 0.98862            | -- | Titer      |
| -/- |              |                      | R2 = 0.98697            | -- | Mean Titer |

### Titer

Titer 0.98697

### Statistics

| Rx | Name       | n | Mean value | Unit | s       | srel [%] |
|----|------------|---|------------|------|---------|----------|
| R1 | Titer      | 6 | 0.98697    | --   | 0.00257 | 0.261    |
| R2 | Mean Titer | 1 | 0.98697    | --   | NaN     | NaN      |

### Raw data

#### Sample

No. 1/6  
Standard TRIS  
Type of standard solid  
Comment  
Titration stand Rondo60/1A  
Weight m = 0.05057 g  
Correction factor f = 1.0  
Purity p = 100.00 %  
Temperature T = 25.0 oC  
Sample start 7/25/2012 2:21:10 PM  
Sample end 7/25/2012 2:26:07 PM

**Method:** HClO4 HClO4 **7/25/2012 2:20:48 PM**  
**Start time:** 7/25/2012 2:21:10 PM

### EQP titration [1]

Titrant HClO4 c = 0.1 mol/L TITER = 1.03681  
 Sensor DG116-Solvent  
 Start potential EST = 413.3 mV  
 No. of EQPs and cand. nEQ = 1  
 Consumption EQP1 VEQ1 = 4.234569 mL  
 Q1 = 0.439044 mmol  
 EEQ1 = 560.2 mV  
 EHN1 = 433.2 mV  
 Excess VEX = 0.425431 mL  
 QEX = 0.044109 mmol  
 End VEND = 4.660 mL  
 QEND = 0.483153 mmol  
 Termination at EQPs  
 Time t = 2:52 min

### Calculation

Result R1 = 0.98582 -- Titer  
 Formula  $R1 = m / (VEQ * c * C)$   
 Constant  $M / (10 * p * z)$   
 C = 0.12114  
 Molar mass M[TRIS] = 121.14 g/mol  
 Equivalent number z[TRIS] = 1  
 Duration tUSE = 04:24 min

### Measured values EQP titration [1]

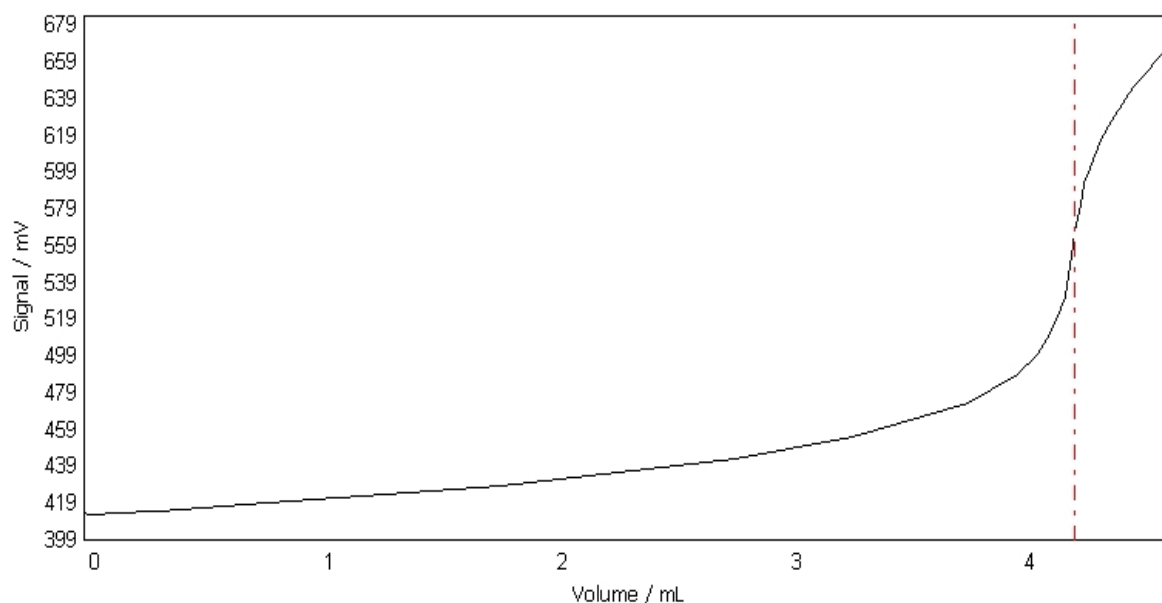
Titrant HClO4 c = 0.1 mol/L TITER = 1.03681  
 Sensor DG116-Solvent  
 Sample 1/6

|      | Volume<br>mL | Increment<br>mL | Signal<br>mV | Change<br>mV | 1st deriv.<br>mV/mL | Time<br>s | Temperature<br>oC |
|------|--------------|-----------------|--------------|--------------|---------------------|-----------|-------------------|
|      | 0.000        | NaN             | 413.3        | NaN          | NaN                 | 0         | 25.0              |
|      | 0.005        | 0.005           | 413.4        | 0.1          | NaN                 | 3         | 25.0              |
|      | 0.010        | 0.005           | 413.1        | -0.3         | NaN                 | 6         | 25.0              |
|      | 0.022        | 0.012           | 413.1        | 0.0          | NaN                 | 9         | 25.0              |
|      | 0.052        | 0.030           | 413.0        | -0.1         | NaN                 | 12        | 25.0              |
|      | 0.127        | 0.075           | 413.5        | 0.5          | 6.37                | 16        | 25.0              |
|      | 0.315        | 0.188           | 414.8        | 1.3          | 7.30                | 19        | 25.0              |
|      | 0.785        | 0.470           | 418.9        | 4.1          | 8.20                | 22        | 25.0              |
|      | 1.285        | 0.500           | 423.8        | 4.9          | 8.53                | 26        | 25.0              |
|      | 1.785        | 0.500           | 428.6        | 4.8          | 9.61                | 29        | 25.0              |
|      | 2.285        | 0.500           | 435.5        | 6.9          | 13.31               | 33        | 25.0              |
|      | 2.785        | 0.500           | 443.5        | 8.0          | 21.88               | 37        | 25.0              |
|      | 3.285        | 0.500           | 455.3        | 11.8         | 38.93               | 44        | 25.0              |
|      | 3.785        | 0.500           | 473.9        | 18.6         | 80.20               | 52        | 25.0              |
|      | 3.993        | 0.208           | 488.7        | 14.8         | 136.85              | 55        | 25.0              |
|      | 4.081        | 0.088           | 500.4        | 11.7         | 202.34              | 62        | 25.0              |
|      | 4.130        | 0.049           | 511.2        | 10.8         | 286.94              | 69        | 25.0              |
|      | 4.162        | 0.032           | 520.0        | 8.8          | 408.55              | 75        | 25.0              |
|      | 4.197        | 0.035           | 531.7        | 11.7         | 525.09              | 81        | 25.0              |
|      | 4.226        | 0.029           | 553.0        | 21.3         | 589.87              | 92        | 25.0              |
|      | 4.234        | 0.008           | 559.7        | 6.7          | 654.48              | 97        | 25.0              |
| EQP1 | 4.234569     | NaN             | 560.2        | NaN          | 654.57              | NaN       | NaN               |
|      | 4.247        | 0.013           | 570.8        | 11.1         | 657.29              | 104       | 25.0              |
|      | 4.261        | 0.014           | 581.1        | 10.3         | 535.55              | 111       | 25.0              |
|      | 4.280        | 0.019           | 593.4        | 12.3         | 517.68              | 120       | 25.0              |
|      | 4.301        | 0.021           | 601.1        | 7.7          | 451.24              | 125       | 25.0              |
|      | 4.353        | 0.052           | 617.1        | 16.0         | NaN                 | 133       | 25.0              |
|      | 4.399        | 0.046           | 626.6        | 9.5          | NaN                 | 138       | 25.0              |
|      | 4.486        | 0.087           | 645.0        | 18.4         | NaN                 | 148       | 25.0              |
|      | 4.541        | 0.055           | 653.0        | 8.0          | NaN                 | 153       | 25.0              |
|      | 4.660        | 0.119           | 671.3        | 18.3         | NaN                 | 163       | 25.0              |

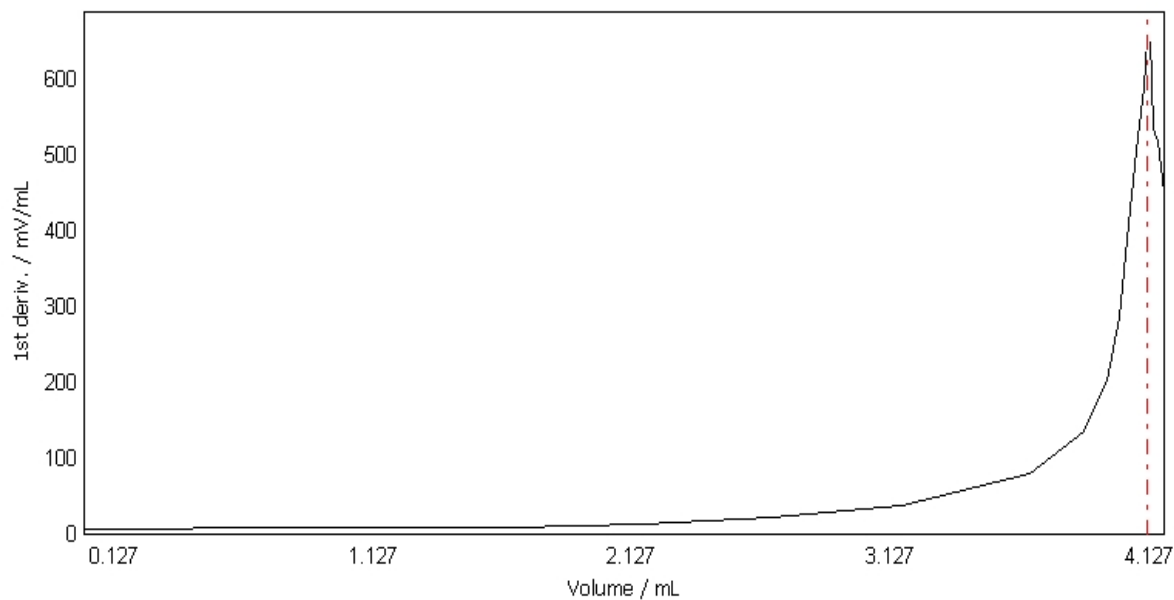
**Method:** HClO4 HClO4  
**Start time:** 7/25/2012 2:21:10 PM

7/25/2012 2:20:48 PM

**E - V curve** EQP titration [1]  
Sample 1/6



**dE/dV - V curve** EQP titration [1]  
Sample 1/6



## Raw data

### Sample

|                   |               |
|-------------------|---------------|
| No.               | 2/6           |
| Standard          | TRIS          |
| Type of standard  | solid         |
| Comment           |               |
| Titration stand   | Rondo60/1A    |
| Weight            | m = 0.05016 g |
| Correction factor | f = 1.0       |
| Purity            | p = 100.00 %  |

**Method:** HClO4 HClO4 **7/25/2012 2:20:48 PM**  
**Start time:** 7/25/2012 2:21:10 PM

Temperature T = 25.0 oC  
Sample start 7/25/2012 2:26:07 PM  
Sample end 7/25/2012 2:30:46 PM

### EQP titration [1]

Titrant HClO4 c = 0.1 mol/L TITER = 1.03681  
Sensor DG116-Solvent  
Start potential EST = 418.8 mV  
No. of EQPs and cand. nEQ = 1  
Consumption EQP1 VEQ1 = 4.202550 mL  
Q1 = 0.435725 mmol  
EEQ1 = 563.8 mV  
EHN1 = 437.1 mV  
Excess VEX = 0.367450 mL  
QEX = 0.038098 mmol  
End VEND = 4.570 mL  
QEND = 0.473822 mmol  
Termination at EQPs  
Time t = 2:31 min

### Calculation

Result R1 = 0.98527 -- Titer  
Formula  $R1 = m / (VEQ * c * C)$   
Constant  $M / (10 * p * z)$   
C = 0.12114  
Molar mass M[TRIS] = 121.14 g/mol  
Equivalent number z[TRIS] = 1  
Duration tUSE = 04:04 min

### Measured values EQP titration [1]

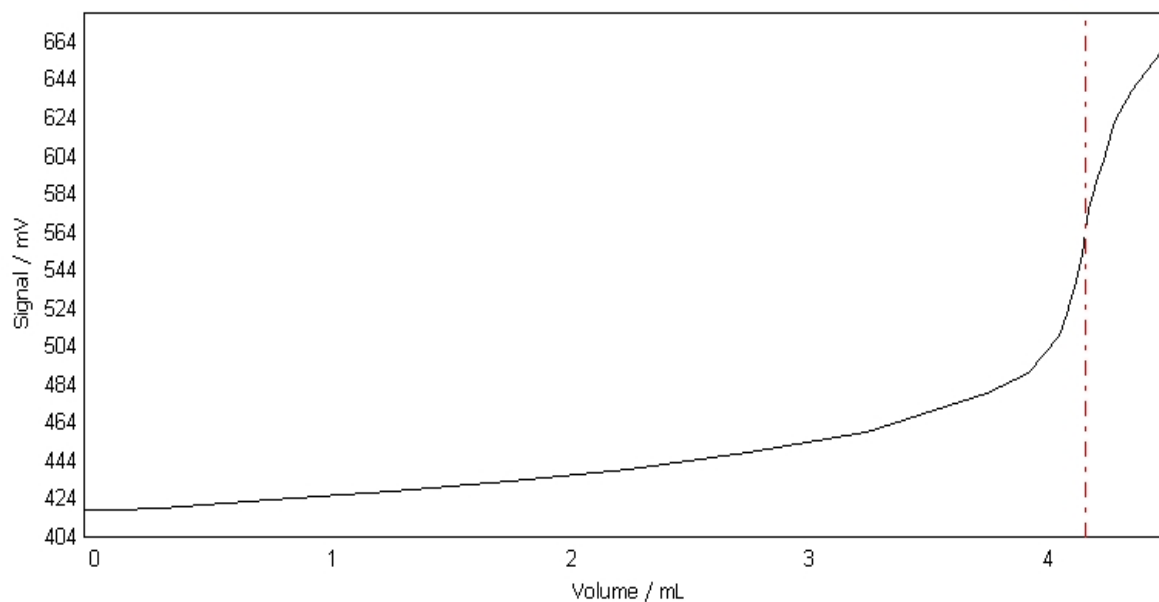
Titrant HClO4 c = 0.1 mol/L TITER = 1.03681  
Sensor DG116-Solvent  
Sample 2/6

|      | Volume<br>mL | Increment<br>mL | Signal<br>mV | Change<br>mV | 1st deriv.<br>mV/mL | Time<br>s | Temperature<br>oC |
|------|--------------|-----------------|--------------|--------------|---------------------|-----------|-------------------|
|      | 0.000        | NaN             | 418.8        | NaN          | NaN                 | 0         | 25.0              |
|      | 0.005        | 0.005           | 418.6        | -0.2         | NaN                 | 3         | 25.0              |
|      | 0.010        | 0.005           | 418.3        | -0.3         | NaN                 | 6         | 25.0              |
|      | 0.022        | 0.012           | 417.9        | -0.4         | NaN                 | 9         | 25.0              |
|      | 0.052        | 0.030           | 418.0        | 0.1          | NaN                 | 12        | 25.0              |
|      | 0.127        | 0.075           | 418.1        | 0.1          | 3.80                | 15        | 25.0              |
|      | 0.315        | 0.188           | 419.4        | 1.3          | 6.17                | 18        | 25.0              |
|      | 0.785        | 0.470           | 423.2        | 3.8          | 7.82                | 21        | 25.0              |
|      | 1.285        | 0.500           | 427.6        | 4.4          | 8.13                | 24        | 25.0              |
|      | 1.785        | 0.500           | 433.3        | 5.7          | 9.88                | 28        | 25.0              |
|      | 2.285        | 0.500           | 439.3        | 6.0          | 12.76               | 32        | 25.0              |
|      | 2.785        | 0.500           | 448.1        | 8.8          | 22.12               | 38        | 25.0              |
|      | 3.285        | 0.500           | 458.9        | 10.8         | 41.31               | 44        | 25.0              |
|      | 3.785        | 0.500           | 479.3        | 20.4         | 87.81               | 54        | 25.0              |
|      | 3.959        | 0.174           | 489.9        | 10.6         | 137.18              | 57        | 25.0              |
|      | 4.090        | 0.131           | 510.0        | 20.1         | 223.54              | 63        | 25.0              |
|      | 4.121        | 0.031           | 520.9        | 10.9         | 315.07              | 70        | 25.0              |
|      | 4.136        | 0.015           | 527.2        | 6.3          | 443.32              | 75        | 25.0              |
|      | 4.160        | 0.024           | 537.6        | 10.4         | 490.75              | 82        | 25.0              |
|      | 4.187        | 0.027           | 552.5        | 14.9         | 563.71              | 87        | 25.0              |
| EQP1 | 4.202550     | NaN             | 563.8        | NaN          | 610.54              | NaN       | NaN               |
|      | 4.204        | 0.017           | 564.9        | 12.4         | 610.34              | 92        | 25.0              |
|      | 4.216        | 0.012           | 576.4        | 11.5         | 585.78              | 99        | 25.0              |
|      | 4.226        | 0.010           | 581.1        | 4.7          | 543.68              | 102       | 25.0              |
|      | 4.251        | 0.025           | 592.6        | 11.5         | 481.61              | 107       | 25.0              |
|      | 4.277        | 0.026           | 602.2        | 9.6          | 418.30              | 111       | 25.0              |
|      | 4.317        | 0.040           | 619.6        | 17.4         | NaN                 | 122       | 25.0              |
|      | 4.341        | 0.024           | 626.9        | 7.3          | NaN                 | 127       | 25.0              |
|      | 4.398        | 0.057           | 638.5        | 11.6         | NaN                 | 133       | 25.0              |
|      | 4.484        | 0.086           | 653.1        | 14.6         | NaN                 | 139       | 25.0              |

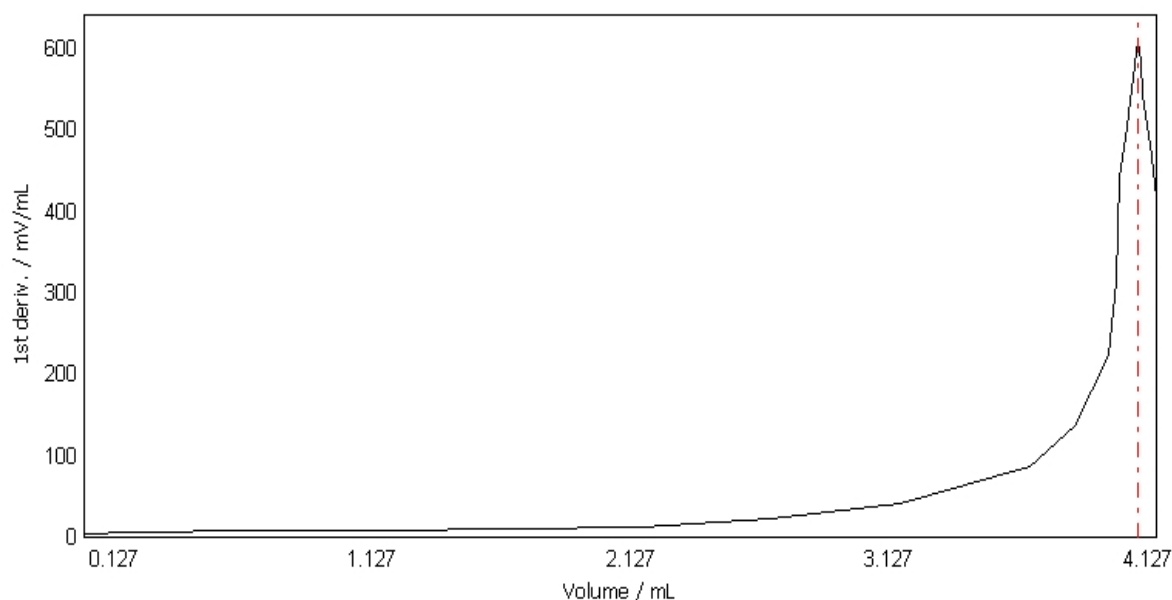
**Method:** HClO4 HClO4 **7/25/2012 2:20:48 PM**  
**Start time:** 7/25/2012 2:21:10 PM

| Volume<br>mL | Increment<br>mL | Signal<br>mV | Change<br>mV | 1st deriv.<br>mV/mL | Time<br>s | Temperature<br>oC |
|--------------|-----------------|--------------|--------------|---------------------|-----------|-------------------|
| 4.570        | 0.086           | 666.3        | 13.2         | NaN                 | 144       | 25.0              |

**E - V curve** EQP titration [1]  
Sample 2/6



**dE/dV - V curve** EQP titration [1]  
Sample 2/6



## Raw data

**Sample**  
No. 3/6  
Standard TRIS  
Type of standard solid

**Method:** HClO4 HClO4 **7/25/2012 2:20:48 PM**  
**Start time:** 7/25/2012 2:21:10 PM

Comment  
Titration stand Rondo60/1A  
Weight m = 0.05455 g  
Correction factor f = 1.0  
Purity p = 100.00 %  
Temperature T = 25.0 oC  
Sample start 7/25/2012 2:30:46 PM  
Sample end 7/25/2012 2:35:46 PM

#### EQP titration [1]

Titrant HClO4 c = 0.1 mol/L TITER = 1.03681  
Sensor DG116-Solvent  
Start potential EST = 419.3 mV  
No. of EQPs and cand. nEQ = 1  
Consumption EQP1 VEQ1 = 4.579769 mL  
Q1 = 0.474835 mmol  
EEQ1 = 573.6 mV  
EHN1 = 437.4 mV  
Excess VEX = 0.361231 mL  
QEX = 0.037453 mmol  
End VEND = 4.941 mL  
QEND = 0.512288 mmol  
Termination at EQPs  
Time t = 2:52 min

#### Calculation

Result R1 = 0.98325 -- Titer  
Formula  $R1 = m / (VEQ * c * C)$   
Constant  $M / (10 * p * z)$   
C = 0.12114  
Molar mass M[TRIS] = 121.14 g/mol  
Equivalent number z[TRIS] = 1  
Duration tUSE = 04:25 min

#### Measured values EQP titration [1]

Titrant HClO4 c = 0.1 mol/L TITER = 1.03681  
Sensor DG116-Solvent  
Sample 3/6

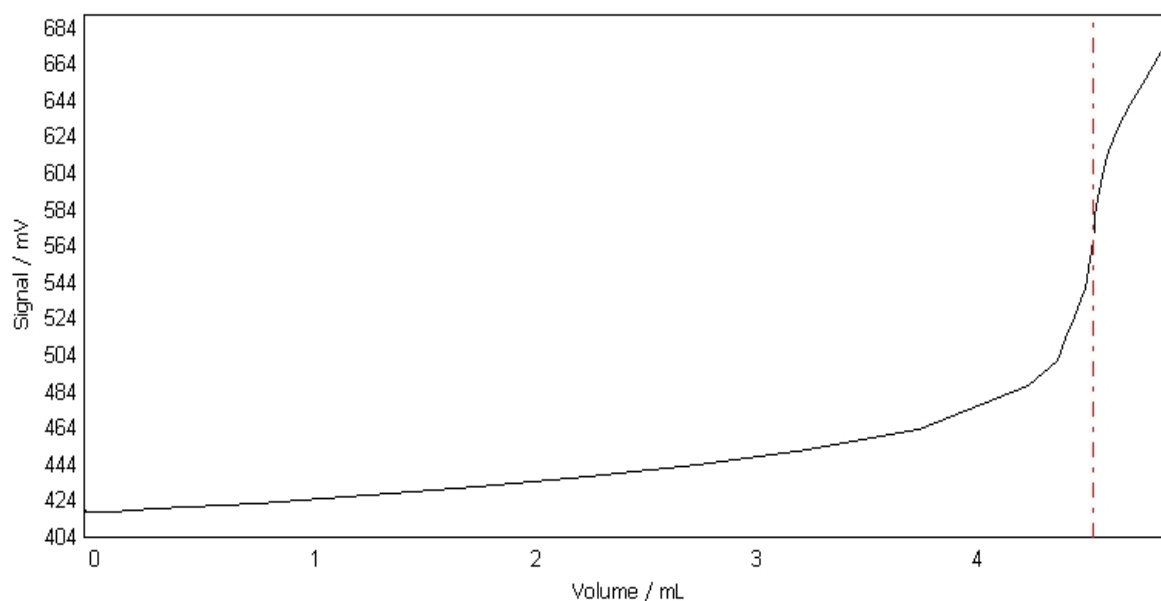
|      | Volume<br>mL | Increment<br>mL | Signal<br>mV | Change<br>mV | 1st deriv.<br>mV/mL | Time<br>s | Temperature<br>oC |
|------|--------------|-----------------|--------------|--------------|---------------------|-----------|-------------------|
|      | 0.000        | NaN             | 419.3        | NaN          | NaN                 | 0         | 25.0              |
|      | 0.005        | 0.005           | 418.8        | -0.5         | NaN                 | 3         | 25.0              |
|      | 0.010        | 0.005           | 418.3        | -0.5         | NaN                 | 6         | 25.0              |
|      | 0.022        | 0.012           | 417.9        | -0.4         | NaN                 | 9         | 25.0              |
|      | 0.052        | 0.030           | 418.0        | 0.1          | NaN                 | 12        | 25.0              |
|      | 0.127        | 0.075           | 418.2        | 0.2          | 3.22                | 16        | 25.0              |
|      | 0.315        | 0.188           | 419.4        | 1.2          | 5.54                | 18        | 25.0              |
|      | 0.785        | 0.470           | 422.8        | 3.4          | 7.37                | 22        | 25.0              |
|      | 1.285        | 0.500           | 427.0        | 4.2          | 8.27                | 25        | 25.0              |
|      | 1.785        | 0.500           | 431.9        | 4.9          | 7.92                | 28        | 25.0              |
|      | 2.285        | 0.500           | 437.3        | 5.4          | 9.85                | 32        | 25.0              |
|      | 2.785        | 0.500           | 443.8        | 6.5          | 14.88               | 35        | 25.0              |
|      | 3.285        | 0.500           | 452.1        | 8.3          | 25.43               | 40        | 25.0              |
|      | 3.785        | 0.500           | 463.7        | 11.6         | 48.87               | 44        | 25.0              |
|      | 4.285        | 0.500           | 487.4        | 23.7         | 108.28              | 51        | 25.0              |
|      | 4.413        | 0.128           | 501.0        | 13.6         | 180.19              | 54        | 25.0              |
|      | 4.464        | 0.051           | 517.6        | 16.6         | 273.64              | 66        | 25.0              |
|      | 4.476        | 0.012           | 520.8        | 3.2          | 361.07              | 70        | 25.0              |
|      | 4.506        | 0.030           | 530.1        | 9.3          | 454.09              | 77        | 25.0              |
|      | 4.540        | 0.034           | 541.3        | 11.2         | 542.56              | 84        | 25.0              |
|      | 4.574        | 0.034           | 566.6        | 25.3         | 626.56              | 92        | 25.0              |
| EQP1 | 4.579769     | NaN             | 573.6        | NaN          | 728.80              | NaN       | NaN               |
|      | 4.581        | 0.007           | 575.1        | 8.5          | 728.77              | 99        | 25.0              |

**Method:** HClO4  
**Start time:** 7/25/2012 2:21:10 PM

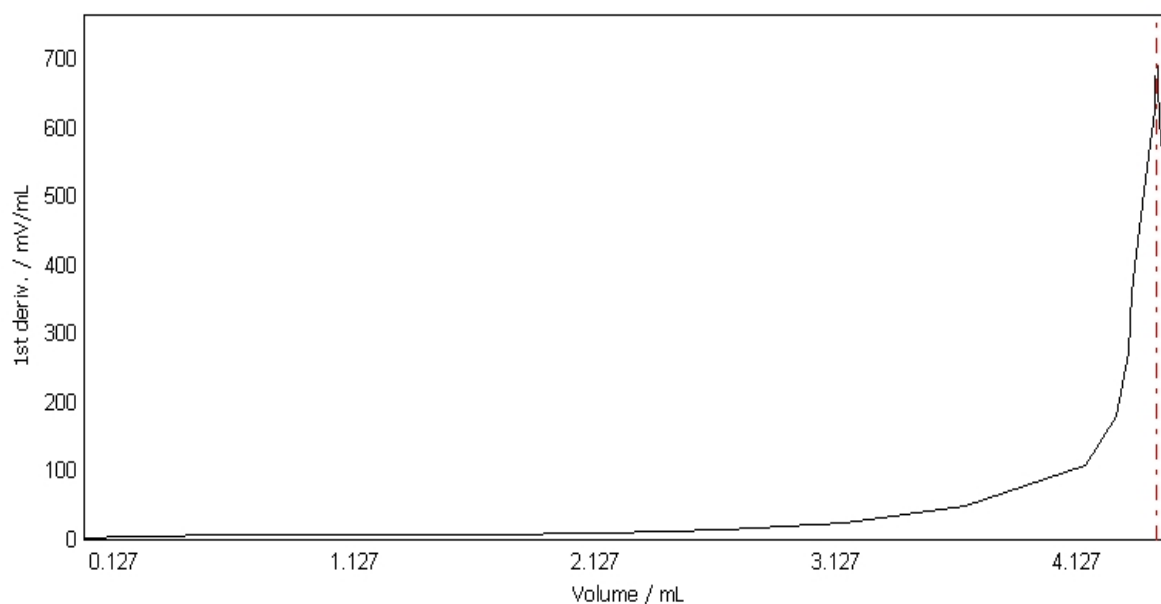
**7/25/2012 2:20:48 PM**

| Volume<br>mL | Increment<br>mL | Signal<br>mV | Change<br>mV | 1st deriv.<br>mV/mL | Time<br>s | Temperature<br>oC |
|--------------|-----------------|--------------|--------------|---------------------|-----------|-------------------|
| 4.587        | 0.006           | 581.1        | 6.0          | 657.62              | 105       | 25.0              |
| 4.601        | 0.014           | 590.2        | 9.1          | 579.16              | 110       | 25.0              |
| 4.629        | 0.028           | 607.2        | 17.0         | 509.57              | 120       | 25.0              |
| 4.650        | 0.021           | 616.0        | 8.8          | 440.68              | 126       | 25.0              |
| 4.691        | 0.041           | 628.6        | 12.6         | NaN                 | 134       | 25.0              |
| 4.745        | 0.054           | 642.2        | 13.6         | NaN                 | 142       | 25.0              |
| 4.803        | 0.058           | 653.2        | 11.0         | NaN                 | 148       | 25.0              |
| 4.887        | 0.084           | 670.3        | 17.1         | NaN                 | 158       | 25.0              |
| 4.941        | 0.054           | 677.7        | 7.4          | NaN                 | 164       | 25.0              |

**E - V curve** EQP titration [1]  
Sample 3/6



**dE/dV - V curve** EQP titration [1]  
Sample 3/6



**Method:** HClO4 HClO4 **7/25/2012 2:20:48 PM**  
**Start time:** 7/25/2012 2:21:10 PM

## Raw data

### Sample

No. 4/6  
Standard TRIS  
Type of standard solid  
Comment  
Titration stand Rondo60/1A  
Weight m = 0.05142 g  
Correction factor f = 1.0  
Purity p = 100.00 %  
Temperature T = 25.0 oC  
Sample start 7/25/2012 2:35:46 PM  
Sample end 7/25/2012 2:41:02 PM

### EQP titration [1]

Titrant HClO4 c = 0.1 mol/L TITER = 1.03681  
Sensor DG116-Solvent  
Start potential EST = 422.0 mV  
No. of EQPs and cand. nEQ = 1  
Consumption EQP1 VEQ1 = 4.291775 mL  
Q1 = 0.444976 mmol  
EEQ1 = 572.6 mV  
EHN1 = 440.4 mV  
Excess VEX = 0.376225 mL  
QEX = 0.039007 mmol  
End VEND = 4.668 mL  
QEND = 0.483983 mmol  
Termination at EQPs  
Time t = 3:07 min

### Calculation

Result R1 = 0.98903 -- Titer  
Formula  $R1 = m / (VEQ * c * C)$   
Constant  $M / (10 * p * z)$   
C = 0.12114  
Molar mass M[TRIS] = 121.14 g/mol  
Equivalent number z[TRIS] = 1  
Duration tUSE = 04:42 min

### Measured values EQP titration [1]

Titrant HClO4 c = 0.1 mol/L TITER = 1.03681  
Sensor DG116-Solvent  
Sample 4/6

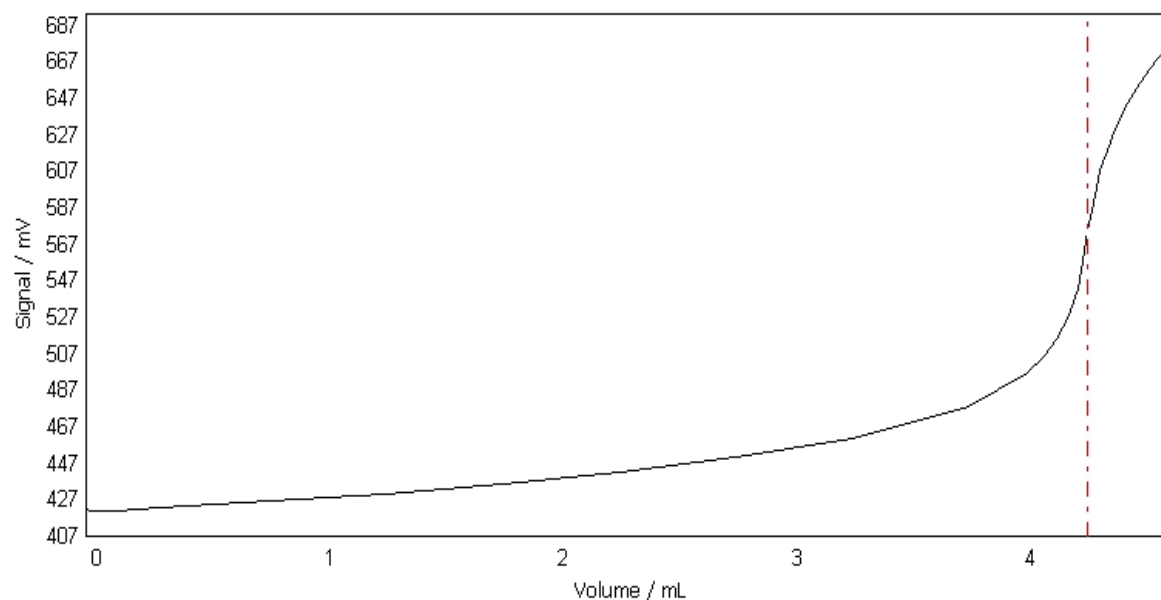
| Volume<br>mL | Increment<br>mL | Signal<br>mV | Change<br>mV | 1st deriv.<br>mV/mL | Time<br>s | Temperature<br>oC |
|--------------|-----------------|--------------|--------------|---------------------|-----------|-------------------|
| 0.000        | NaN             | 422.0        | NaN          | NaN                 | 0         | 25.0              |
| 0.005        | 0.005           | 421.5        | -0.5         | NaN                 | 3         | 25.0              |
| 0.010        | 0.005           | 421.2        | -0.3         | NaN                 | 6         | 25.0              |
| 0.022        | 0.012           | 421.0        | -0.2         | NaN                 | 9         | 25.0              |
| 0.052        | 0.030           | 420.8        | -0.2         | NaN                 | 12        | 25.0              |
| 0.127        | 0.075           | 421.0        | 0.2          | 4.02                | 15        | 25.0              |
| 0.315        | 0.188           | 422.3        | 1.3          | 5.87                | 18        | 25.0              |
| 0.785        | 0.470           | 426.0        | 3.7          | 7.70                | 21        | 25.0              |
| 1.285        | 0.500           | 430.4        | 4.4          | 8.61                | 25        | 25.0              |
| 1.785        | 0.500           | 435.5        | 5.1          | 9.13                | 28        | 25.0              |
| 2.285        | 0.500           | 442.3        | 6.8          | 12.74               | 32        | 25.0              |
| 2.785        | 0.500           | 450.3        | 8.0          | 20.91               | 38        | 25.0              |
| 3.285        | 0.500           | 460.8        | 10.5         | 36.62               | 44        | 25.0              |
| 3.785        | 0.500           | 477.8        | 17.0         | 76.79               | 52        | 25.0              |
| 4.034        | 0.249           | 496.3        | 18.5         | 131.14              | 61        | 25.0              |
| 4.109        | 0.075           | 506.0        | 9.7          | 183.73              | 68        | 25.0              |



**Method:** HCLO4      **HCLO4**      **7/25/2012 2:20:48 PM**  
**Start time:** 7/25/2012 2:21:10 PM

|      | Volume<br>mL | Increment<br>mL | Signal<br>mV | Change<br>mV | 1st deriv.<br>mV/mL | Time<br>s | Temperature<br>oC |
|------|--------------|-----------------|--------------|--------------|---------------------|-----------|-------------------|
| EQP1 | 4.162        | 0.053           | 515.0        | 9.0          | 255.40              | 75        | 25.0              |
|      | 4.215        | 0.053           | 527.9        | 12.9         | 377.91              | 82        | 25.0              |
|      | 4.250        | 0.035           | 542.3        | 14.4         | 517.32              | 91        | 25.0              |
|      | 4.267        | 0.017           | 552.5        | 10.2         | 556.18              | 97        | 25.0              |
|      | 4.281        | 0.014           | 562.7        | 10.2         | 617.52              | 102       | 25.0              |
|      | 4.291775     | NaN             | 572.6        | NaN          | 693.46              | NaN       | NaN               |
|      | 4.294        | 0.013           | 574.6        | 11.9         | 693.43              | 110       | 25.0              |
|      | 4.304        | 0.010           | 581.0        | 6.4          | 633.28              | 114       | 25.0              |
|      | 4.329        | 0.025           | 598.2        | 17.2         | 553.24              | 123       | 25.0              |
|      | 4.345        | 0.016           | 606.8        | 8.6          | 505.72              | 129       | 25.0              |
|      | 4.374        | 0.029           | 618.7        | 11.9         | 414.82              | 137       | 25.0              |
|      | 4.412        | 0.038           | 630.3        | 11.6         | NaN                 | 145       | 25.0              |
|      | 4.465        | 0.053           | 644.0        | 13.7         | NaN                 | 154       | 25.0              |
|      | 4.519        | 0.054           | 655.5        | 11.5         | NaN                 | 162       | 25.0              |
|      | 4.588        | 0.069           | 667.8        | 12.3         | NaN                 | 170       | 25.0              |
|      | 4.668        | 0.080           | 680.4        | 12.6         | NaN                 | 178       | 25.0              |

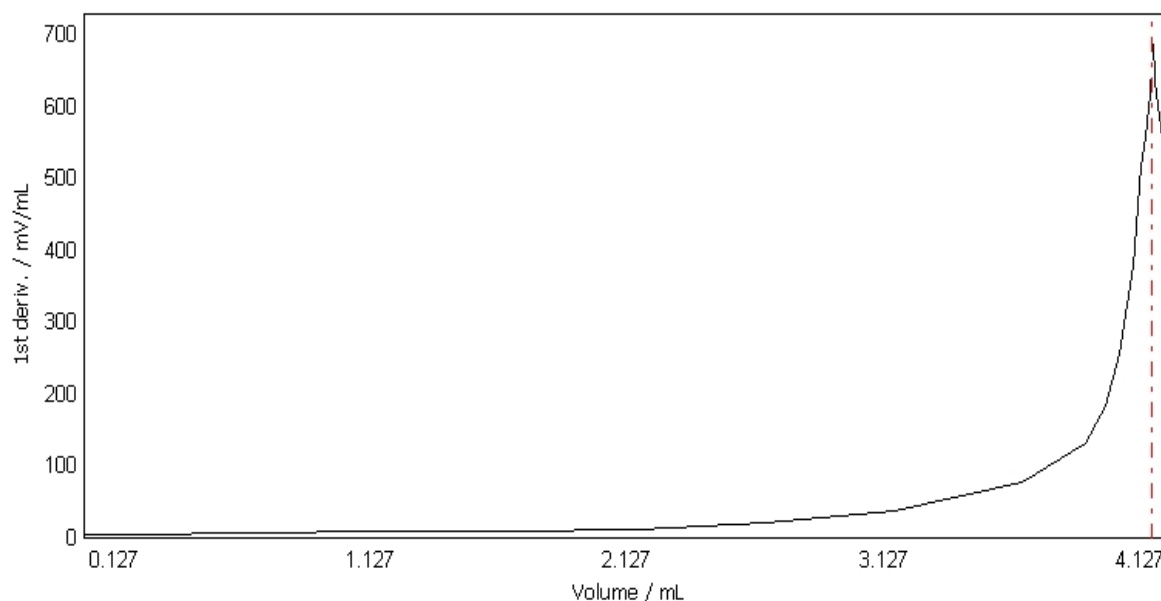
**E - V curve**      **EQP titration [1]**  
Sample      4/6



Method: HClO4 HClO4  
Start time: 7/25/2012 2:21:10 PM

7/25/2012 2:20:48 PM

dE/dV - V curve EQP titration [1]  
Sample 4/6



## Raw data

### Sample

No. 5/6  
Standard TRIS  
Type of standard solid  
Comment  
Titration stand Rondo60/1A  
Weight  $m = 0.05187$  g  
Correction factor  $f = 1.0$   
Purity  $p = 100.00$  %  
Temperature  $T = 25.0$  °C  
Sample start 7/25/2012 2:41:03 PM  
Sample end 7/25/2012 2:46:01 PM

### EQP titration [1]

Titrant HClO4  $c = 0.1$  mol/L TITER = 1.03681  
Sensor DG116-Solvent  
Start potential EST = 423.6 mV  
No. of EQPs and cand. nEQ = 1  
Consumption EQP1 VEQ1 = 4.325893 mL  
Q1 = 0.448513 mmol  
EEQ1 = 575.1 mV  
EHN1 = 441.1 mV  
Excess VEX = 0.411107 mL  
QEX = 0.042624 mmol  
End VEND = 4.737 mL  
QEND = 0.491137 mmol  
Termination at EQPs  
Time  $t = 2:47$  min

### Calculation

Result  $R1 = 0.98981$  -- Titer  
Formula  $R1 = m / (VEQ \cdot c \cdot C)$   
Constant  $M / (10 \cdot p \cdot z)$   
 $C = 0.12114$

**Method:** HClO4 HClO4 **7/25/2012 2:20:48 PM**  
**Start time:** 7/25/2012 2:21:10 PM

Molar mass M[TRIS] = 121.14 g/mol  
Equivalent number z[TRIS] = 1  
Duration tUSE = 04:22 min

**Measured values EQP titration [1]**

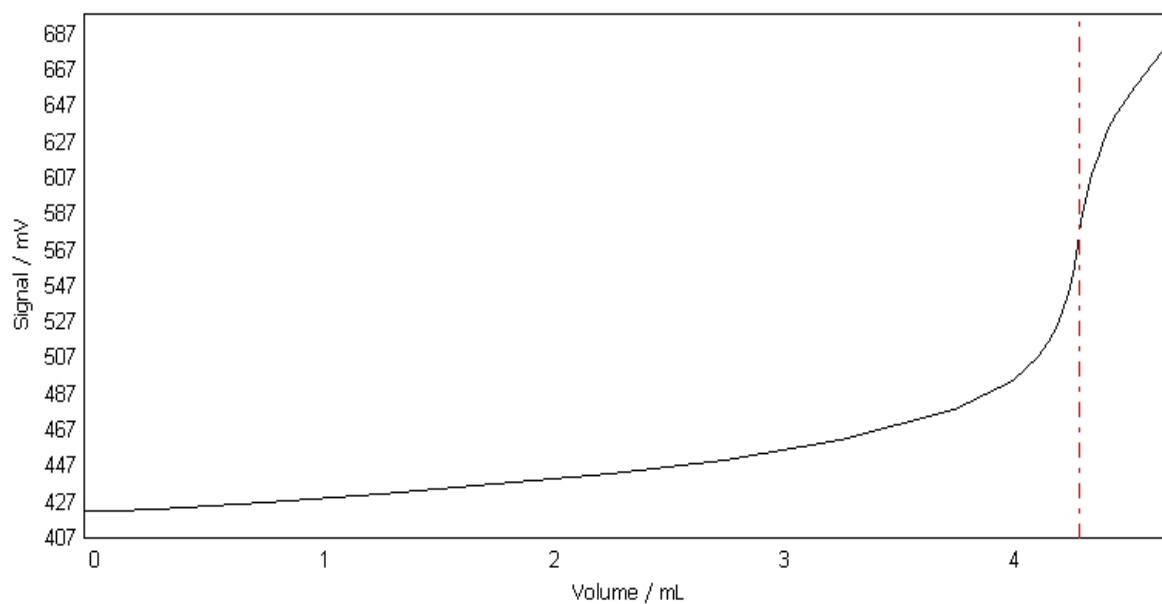
Titrant HClO4 c = 0.1 mol/L TITER = 1.03681  
Sensor DG116-Solvent  
Sample 5/6

|      | Volume<br>mL | Increment<br>mL | Signal<br>mV | Change<br>mV | 1st deriv.<br>mV/mL | Time<br>s | Temperature<br>oC |
|------|--------------|-----------------|--------------|--------------|---------------------|-----------|-------------------|
|      | 0.000        | NaN             | 423.6        | NaN          | NaN                 | 0         | 25.0              |
|      | 0.005        | 0.005           | 422.3        | -1.3         | NaN                 | 3         | 25.0              |
|      | 0.010        | 0.005           | 422.1        | -0.2         | NaN                 | 6         | 25.0              |
|      | 0.022        | 0.012           | 421.8        | -0.3         | NaN                 | 9         | 25.0              |
|      | 0.052        | 0.030           | 421.6        | -0.2         | NaN                 | 12        | 25.0              |
|      | 0.127        | 0.075           | 421.8        | 0.2          | 3.40                | 15        | 25.0              |
|      | 0.315        | 0.188           | 423.3        | 1.5          | 6.23                | 18        | 25.0              |
|      | 0.785        | 0.470           | 426.9        | 3.6          | 7.58                | 22        | 25.0              |
|      | 1.285        | 0.500           | 431.6        | 4.7          | 8.06                | 25        | 25.0              |
|      | 1.785        | 0.500           | 436.6        | 5.0          | 8.99                | 28        | 25.0              |
|      | 2.285        | 0.500           | 442.5        | 5.9          | 12.17               | 31        | 25.0              |
|      | 2.785        | 0.500           | 449.8        | 7.3          | 20.14               | 34        | 25.0              |
|      | 3.285        | 0.500           | 461.5        | 11.7         | 35.23               | 42        | 25.0              |
|      | 3.785        | 0.500           | 478.3        | 16.8         | 73.06               | 50        | 25.0              |
|      | 4.040        | 0.255           | 494.2        | 15.9         | 123.76              | 53        | 25.0              |
|      | 4.144        | 0.104           | 507.4        | 13.2         | 181.37              | 60        | 25.0              |
|      | 4.191        | 0.047           | 516.3        | 8.9          | 251.04              | 67        | 25.0              |
|      | 4.233        | 0.042           | 525.6        | 9.3          | 354.83              | 72        | 25.0              |
|      | 4.280        | 0.047           | 543.4        | 17.8         | 492.39              | 80        | 25.0              |
|      | 4.298        | 0.018           | 553.3        | 9.9          | 522.02              | 84        | 25.0              |
|      | 4.313        | 0.015           | 563.7        | 10.4         | 589.67              | 88        | 25.0              |
| EQP1 | 4.325893     | NaN             | 575.1        | NaN          | 649.05              | NaN       | NaN               |
|      | 4.327        | 0.014           | 576.1        | 12.4         | 648.97              | 95        | 25.0              |
|      | 4.337        | 0.010           | 582.7        | 6.6          | 618.56              | 99        | 25.0              |
|      | 4.362        | 0.025           | 597.8        | 15.1         | 536.55              | 106       | 25.0              |
|      | 4.384        | 0.022           | 608.9        | 11.1         | 473.69              | 113       | 25.0              |
|      | 4.413        | 0.029           | 620.4        | 11.5         | 392.75              | 120       | 25.0              |
|      | 4.451        | 0.038           | 633.6        | 13.2         | NaN                 | 131       | 25.0              |
|      | 4.491        | 0.040           | 642.5        | 8.9          | NaN                 | 137       | 25.0              |
|      | 4.576        | 0.085           | 658.8        | 16.3         | NaN                 | 144       | 25.0              |
|      | 4.648        | 0.072           | 670.4        | 11.6         | NaN                 | 150       | 25.0              |
|      | 4.737        | 0.089           | 685.3        | 14.9         | NaN                 | 160       | 25.0              |

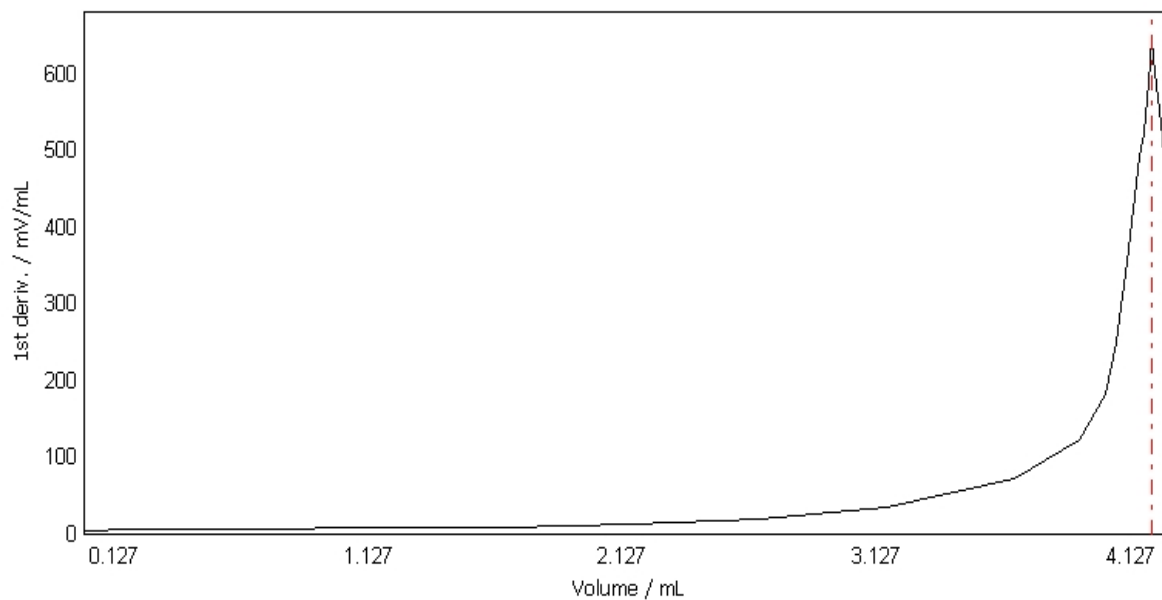
Method: HClO<sub>4</sub> HClO<sub>4</sub>  
Start time: 7/25/2012 2:21:10 PM

7/25/2012 2:20:48 PM

E - V curve EQP titration [1]  
Sample 5/6



dE/dV - V curve EQP titration [1]  
Sample 5/6



## Raw data

### Sample

|                   |               |
|-------------------|---------------|
| No.               | 6/6           |
| Standard          | TRIS          |
| Type of standard  | solid         |
| Comment           |               |
| Titration stand   | Rondo60/1A    |
| Weight            | m = 0.05432 g |
| Correction factor | f = 1.0       |
| Purity            | p = 100.00 %  |

**Method:** HClO4 HClO4 **7/25/2012 2:20:48 PM**  
**Start time:** 7/25/2012 2:21:10 PM

Temperature T = 25.0 oC  
Sample start 7/25/2012 2:46:01 PM  
Sample end 7/25/2012 2:50:57 PM

### EQP titration [1]

Titrant HClO4 c = 0.1 mol/L TITER = 1.03681  
Sensor DG116-Solvent  
Start potential EST = 422.9 mV  
No. of EQPs and cand. nEQ = 1  
Consumption EQP1 VEQ1 = 4.535669 mL  
Q1 = 0.470263 mmol  
EEQ1 = 572.1 mV  
EHN1 = 440.8 mV  
Excess VEX = 0.373331 mL  
QEX = 0.038707 mmol  
End VEND = 4.909 mL  
QEND = 0.508970 mmol  
Termination at EQPs  
Time t = 2:45 min

### Calculation

Result R1 = 0.98862 -- Titer  
Formula  $R1 = m / (VEQ * c * C)$   
Constant  $M / (10 * p * z)$   
C = 0.12114  
Molar mass M[TRIS] = 121.14 g/mol  
Equivalent number z[TRIS] = 1  
Duration tUSE = 04:20 min

### Measured values EQP titration [1]

Titrant HClO4 c = 0.1 mol/L TITER = 1.03681  
Sensor DG116-Solvent  
Sample 6/6

|      | Volume<br>mL | Increment<br>mL | Signal<br>mV | Change<br>mV | 1st deriv.<br>mV/mL | Time<br>s | Temperature<br>oC |
|------|--------------|-----------------|--------------|--------------|---------------------|-----------|-------------------|
|      | 0.000        | NaN             | 422.9        | NaN          | NaN                 | 0         | 25.0              |
|      | 0.005        | 0.005           | 421.9        | -1.0         | NaN                 | 4         | 25.0              |
|      | 0.010        | 0.005           | 421.6        | -0.3         | NaN                 | 7         | 25.0              |
|      | 0.022        | 0.012           | 421.5        | -0.1         | NaN                 | 10        | 25.0              |
|      | 0.052        | 0.030           | 421.3        | -0.2         | NaN                 | 13        | 25.0              |
|      | 0.127        | 0.075           | 421.5        | 0.2          | 2.97                | 16        | 25.0              |
|      | 0.315        | 0.188           | 422.8        | 1.3          | 5.57                | 19        | 25.0              |
|      | 0.785        | 0.470           | 426.2        | 3.4          | 7.59                | 22        | 25.0              |
|      | 1.285        | 0.500           | 430.4        | 4.2          | 8.20                | 25        | 25.0              |
|      | 1.785        | 0.500           | 435.7        | 5.3          | 8.16                | 29        | 25.0              |
|      | 2.285        | 0.500           | 441.0        | 5.3          | 9.50                | 32        | 25.0              |
|      | 2.785        | 0.500           | 447.3        | 6.3          | 15.13               | 36        | 25.0              |
|      | 3.285        | 0.500           | 455.2        | 7.9          | 25.70               | 40        | 25.0              |
|      | 3.785        | 0.500           | 467.9        | 12.7         | 50.90               | 46        | 25.0              |
|      | 4.226        | 0.441           | 487.8        | 19.9         | 105.78              | 49        | 25.0              |
|      | 4.377        | 0.151           | 505.7        | 17.9         | 177.64              | 56        | 25.0              |
|      | 4.416        | 0.039           | 513.2        | 7.5          | 258.89              | 60        | 25.0              |
|      | 4.455        | 0.039           | 524.5        | 11.3         | 381.20              | 66        | 25.0              |
|      | 4.482        | 0.027           | 535.7        | 11.2         | 522.49              | 72        | 25.0              |
|      | 4.502        | 0.020           | 544.0        | 8.3          | 581.44              | 76        | 25.0              |
|      | 4.531        | 0.029           | 567.3        | 23.3         | 708.54              | 85        | 25.0              |
| EQP1 | 4.535669     | NaN             | 572.1        | NaN          | 771.86              | NaN       | NaN               |
|      | 4.539        | 0.008           | 575.6        | 8.3          | 770.65              | 91        | 25.0              |
|      | 4.548        | 0.009           | 582.6        | 7.0          | 673.98              | 95        | 25.0              |
|      | 4.569        | 0.021           | 599.9        | 17.3         | 592.05              | 104       | 25.0              |
|      | 4.583        | 0.014           | 608.8        | 8.9          | 558.43              | 111       | 25.0              |
|      | 4.607        | 0.024           | 619.4        | 10.6         | 470.74              | 118       | 25.0              |
|      | 4.646        | 0.039           | 629.7        | 10.3         | NaN                 | 123       | 25.0              |
|      | 4.721        | 0.075           | 650.2        | 20.5         | NaN                 | 134       | 25.0              |
|      | 4.764        | 0.043           | 659.4        | 9.2          | NaN                 | 141       | 25.0              |

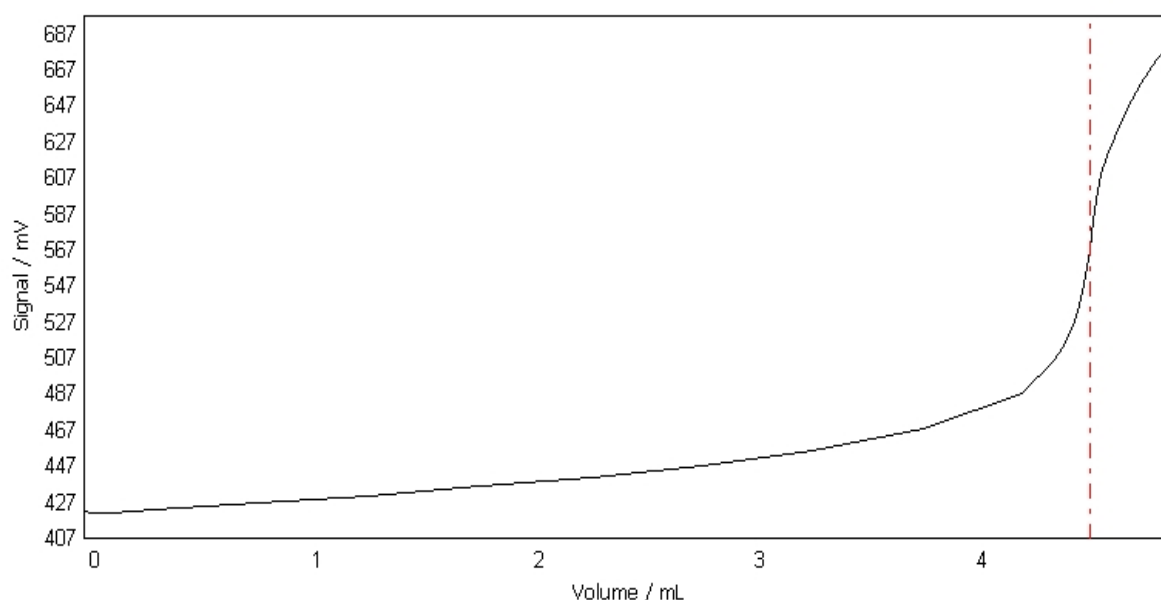
Method: HClO4 HClO4

7/25/2012 2:20:48 PM

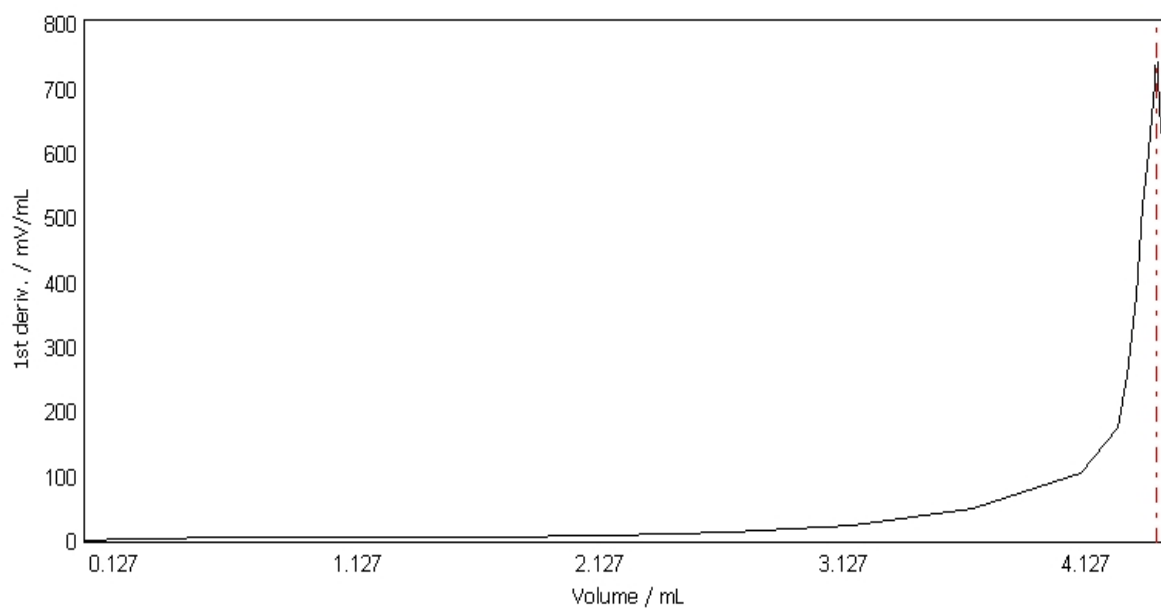
Start time: 7/25/2012 2:21:10 PM

| Volume<br>mL | Increment<br>mL | Signal<br>mV | Change<br>mV | 1st deriv.<br>mV/mL | Time<br>s | Temperature<br>oC |
|--------------|-----------------|--------------|--------------|---------------------|-----------|-------------------|
| 4.834        | 0.070           | 672.4        | 13.0         | NaN                 | 149       | 25.0              |
| 4.909        | 0.075           | 683.6        | 11.2         | NaN                 | 157       | 25.0              |

E - V curve EQP titration [1]  
Sample 6/6



dE/dV - V curve EQP titration [1]  
Sample 6/6



## Raw data

## Calculation

Result R2 = 0.98697 -- Mean Titer  
Formula R2=Mean[R1]  
Constant 1

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|                    |                             |                         |                             |
|--------------------|-----------------------------|-------------------------|-----------------------------|
| <b>Method:</b>     | <b>HClO<sub>4</sub></b>     | <b>HClO<sub>4</sub></b> | <b>7/25/2012 2:20:48 PM</b> |
| <b>Start time:</b> | <b>7/25/2012 2:21:10 PM</b> |                         |                             |

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|                   |                   |
|-------------------|-------------------|
| Molar mass        | C = 1             |
| Equivalent number | M[None] = 1 g/mol |
|                   | z[None] = 1       |

**Titer**

|         |                                 |
|---------|---------------------------------|
| Titrant | HClO <sub>4</sub> c = 0.1 mol/L |
| Titer   | 0.98697                         |

- 
- (1) Modified
  - (2) Excluded
  - (3) Outside limits
  - (4) Resource expired
  - (5) srel above max srel
  - (6) srel above max srel for multiple determination
  - (7) Value outside limits, not saved in setup
  - (8) Sample data outside limits
  - (9) Standard evaluation used
  - (10) Result from buffer

**Created:** - (Administrator), 7/25/2012 2:26:10 PM