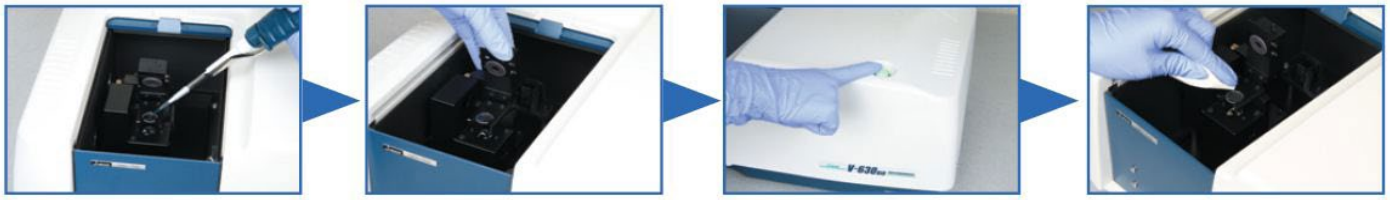
Application Note



Step 1
Drop a sample on the cell.

Step 2
Set the cover glass.

Step 3
Push the start button.

Step 4
Wipe the sample off.

Measurement reproducibility using SAH-769 one-drop measurement unit with V-630 UV-visible spectrophotometer

Introduction

SAH-769 one-drop measurement unit is the premier accessory for multiple-sample quantitation of proteins and nucleic acids. Simply dispense one drop of sample (5 µL for 1 mm path length; 0.6 µL for 0.2 mm path length) on the cell, set the cover glass and start the measurement.

Here, we present the measurement reproducibility of calf thymus DNA using SAH-769 one-drop measurement unit with 1- and 0.2-mm path length cells.

V-630 UV-visible spectrophotometer

with SAH-769 one-drop measurement unit

Keywords: One-drop measurement, protein, nucleic acid, calf thymus DNA, absorbance reproducibility, detection limit, quantitation limit, V-630, SAH769 One-drop accessory

JASCO INC.
28600 Mary's Court, Easton, MD 21601 USA
Tel: (800) 333-5272, Fax: (410) 822-7526
Application Library: http://www.jascoinc.com/applications

Measurement system

V-630BIO:	UV-Vis spectrophotometer for routine biological measurements
SAH-769:	One-drop accessory
Dedicated cells:	1 mm cell (minimum sample volume: 5 µL)
	0.2 mm cell (minimum sample volume: 0.6 µL)

Sample

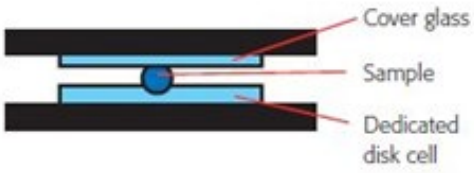
Aqueous solution of calf thymus DNA

Procedure

A 'blank' was recorded for the empty cell, prior to data collection. A drop of sample was dispensed and measured, and then the measured sample was wiped from the cell. This procedure was repeated ten times.

Parameters

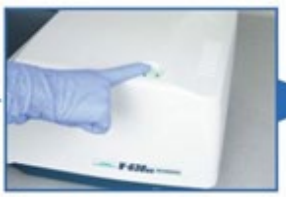
Wavelength:	260 nm
Bandwidth:	1.5 nm
Response:	Medium



Dedicated disk cell for SAH-769
Optical pathlength : 1 mm (left), 0.2 mm (right)
Sample volume : 5 µL (left), 0.6 µL (right)

Step 1
Drop a sample on the cell.

Step 2
Set the cover glass.



Step 3
Push the start button.

Step 4
Wipe the sample off.

JASCO INC.
28600 Mary's Court, Easton, MD 21601 USA
Tel: (800) 333-5272, Fax: (410) 822-7526
Application Library: http://www.jascoinc.com/applications

Results

1 mm path length cell

Table 1: Absorbance reproducibility

Conc. [ng/µL]	0	2.4	4.8	9.6	19.3	38.6	77.2	154.4	308.8	617.5
1	-0.0008	0.0047	0.0084	0.0179	0.0321	0.0676	0.133	0.259	0.516	0.998
2	0.0003	0.0059	0.0093	0.0146	0.0332	0.0677	0.131	0.260	0.518	1.003
3	0.0012	0.0056	0.0083	0.0162	0.0334	0.0705	0.130	0.260	0.519	1.003
4	0.0015	0.0063	0.0072	0.0181	0.0345	0.0679	0.130	0.262	0.512	1.024
5	-0.0002	0.0067	0.0071	0.0166	0.0329	0.0676	0.132	0.264	0.517	0.993
6	-0.0013	0.0053	0.0088	0.0204	0.0331	0.0672	0.130	0.259	0.522	0.996
7	0.0013	0.0049	0.0082	0.0170	0.0336	0.0695	0.129	0.259	0.511	0.996
8	0.0002	0.0036	0.0089	0.0168	0.0326	0.0680	0.133	0.260	0.509	1.006
9	0.0027	0.0058	0.0089	0.0177	0.0315	0.0676	0.134	0.260	0.509	1.000
10	-0.0004	0.0043	0.0069	0.0153	0.0353	0.0692	0.132	0.267	0.509	0.995
A.V. [Abs]	0.0004	0.0053	0.0082	0.0171	0.0332	0.0683	0.131	0.261	0.514	1.001
S.D.	0.0012	0.0010	0.0008	0.0016	0.0011	0.0011	0.0015	0.0026	0.0047	0.0089
C.V. [%]	N/A	17.9	10.3	9.6	3.3	1.6	1.2	1.0	0.9	0.9

Calibration equation: Abs = 0.00163 x Conc. + 0.00366
Correlation coefficient: 0.9998

Table 2: Concentration reproducibility

Conc. [ng/µL]	0	2.4	4.8	9.6	19.3	38.6	77.2	154.4	308.8	617.5
1	-2.8	0.6	2.9	8.8	17.5	39.3	79.8	157.3	315.0	611.5
2	-2.1	1.4	3.4	6.7	18.2	39.4	78.0	157.7	316.3	614.6
3	-1.5	1.2	2.9	7.7	18.3	41.1	78.0	157.9	316.9	614.7
4	-1.3	1.7	2.2	8.9	18.9	39.5	77.7	158.8	312.4	627.6
5	-2.4	1.9	2.1	8.0	18.0	39.3	78.7	160.0	316.0	608.8
6	-3.1	1.0	3.1	10.3	18.1	39.1	77.5	157.0	318.7	610.4
7	-1.4	0.7	2.8	8.2	18.4	40.5	77.4	157.1	312.0	610.3
8	-2.1	0.0	3.2	8.1	17.8	39.6	79.3	157.8	311.1	616.5
9	-0.6	1.3	3.2	8.6	17.1	39.3	80.0	157.4	310.9	612.8
10	-2.5	0.4	2.0	7.1	19.5	40.3	78.9	162.2	311.0	609.9
A.V. [ng/µL]	-2.0	1.0	2.8	8.2	18.2	39.8	78.5	158.3	314.0	613.7
S.D.	0.75	0.59	0.52	1.00	0.68	0.66	0.95	1.63	2.88	5.48
C.V. [%]	N/A	57.4	18.7	12.2	3.7	1.7	1.2	1.0	0.9	0.9

Detection limit*: 5 ng/µL
Quantitation limit*: 10 ng/µL

JASCO INC.
28600 Mary's Court, Easton, MD 21601 USA
Tel: (800) 333-5272, Fax: (410) 822-7526
Application Library: http://www.jascoinc.com/applications

0.2 mm path length cell

Table 3: Absorbance reproducibility

Conc. [ng/µL]	0	38.6	77.2	154.4	308.8	617.5	1235	2470	4940	617.5
1	0.0008	0.0122	0.0196	0.0460	0.0842	0.166	0.326	0.646	1.297	611.5
2	-0.0011	0.0165	0.0223	0.0430	0.0847	0.166	0.330	0.645	1.319	614.6
3	-0.0001	0.0160	0.0195	0.0427	0.0873	0.170	0.328	0.653	1.320	614.7
4	-0.0004	0.0112	0.0176	0.0430	0.0863	0.165	0.331	0.654	1.284	627.6
5	0.0069	0.0152	0.0180	0.0410	0.0860	0.168	0.327	0.647	1.307	608.8
6	-0.0005	0.0139	0.0184	0.0424	0.0845	0.170	0.326	0.660	1.303	610.4
7	0.0006	0.0137	0.0206	0.0450	0.0839	0.170	0.331	0.659	1.312	610.3
8	0.0019	0.0127	0.0200	0.0440	0.0875	0.168	0.330	0.658	1.301	616.5
9	0.0011	0.0130	0.0212	0.0435	0.0851	0.169	0.338	0.663	1.296	612.8
10	0.0007	0.0134	0.0194	0.0426	0.0879	0.171	0.326	0.664	1.308	609.9
A.V.	0.0010	0.0138	0.0197	0.0433	0.0857	0.168	0.329	0.655	1.305	613.7
S.D.	0.0023	0.0017	0.0015	0.0014	0.0015	0.0020	0.0037	0.0071	0.0110	5.48
C.V.	N/A	12.2	7.4	3.3	1.7	1.2	1.1	1.1	0.8	0.9

Calibration equation: Abs = 0.000264 x Conc. + 0.00281
Correlation coefficient: 0.9998

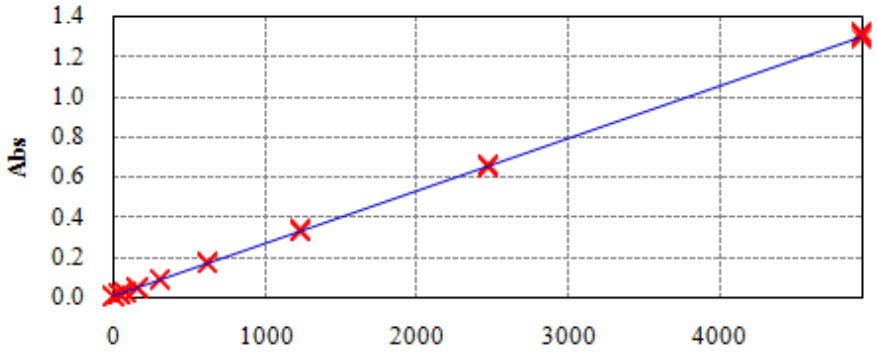
Table 4: Concentration reproducibility

Conc. [ng/µL]	0	38.6	77.2	154.4	308.8	617.5	1235	2470	4940	617.5
1	-7.8	35.5	63.7	163.8	308.5	617.6	1224	2438	4909	611.5
2	-15.0	51.9	74.0	152.4	310.6	620.2	1242	2434	4991	614.6
3	-11.1	50.0	63.5	151.2	320.4	635.6	1233	2467	4993	614.7
4	-12.0	31.9	56.3	152.3	316.8	616.2	1246	2468	4856	627.6
5	15.7	46.8	57.5	145.0	315.3	625.2	1228	2441	4946	608.8
6	-12.4	41.9	59.3	150.3	309.7	635.3	1227	2493	4932	610.4
7	-8.4	41.2	67.4	160.1	307.6	632.5	1245	2489	4963	610.3
8	-3.4	37.5	65.0	156.1	321.3	625.1	1241	2484	4924	616.5
9	-6.4	38.6	69.9	154.4	312.0	629.5	1271	2503	4904	612.8
10	-8.1	40.1	63.0	150.9	322.6	637.3	1227	2505	4950	609.9
A.V.	-6.9	41.5	63.9	153.7	314.5	627.5	1238	2472	4937	613.7
S.D.	8.60	6.36	5.51	5.34	5.58	7.77	14.19	27.04	41.61	5.48
C.V.	N/A	15.3	8.6	3.5	1.8	1.2	1.1	1.1	0.8	0.9

Detection limit*: 5 ng/µL
Quantitation limit*: 100 ng/µL

JASCO INC.
28600 Mary's Court, Easton, MD 21601 USA
Tel: (800) 333-5272, Fax: (410) 822-7526
Application Library: http://www.jascoinc.com/applications

*The detection limit is calculated using 3.3s. The quantitation limit is calculated using 10σ.
σ is the standard deviation in 0 ng/µL of a sample concentration.



JASCO INC.
28600 Mary's Court, Easton, MD 21601 USA
Tel: (800) 333-5272, Fax: (410) 822-7526
Application Library: http://www.jascoinc.com/applications