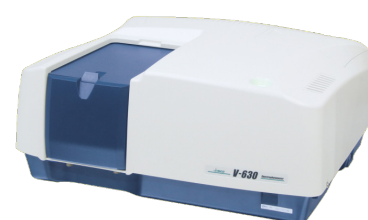


## Measurement Reproducibility using a SAH-769 One Drop Measurement Accessory

### Introduction

The SAH-769 One Drop accessory is used for fast and accurate quantitation small volumes of proteins and nucleic acids. To make a measurement a single drop of sample is pipetted onto the cell (5 $\mu$ L for 1mm or 0.6 $\mu$ L for 0.2 mm optical pathlengths).

This application note demonstrates both the reproducibility and linearity of the SAH-769 One Drop accessory using calf thymus DNA with both 1 and 0.2 mm pathlength cells.



**V-630**

UV-Vis Spectrophotometer

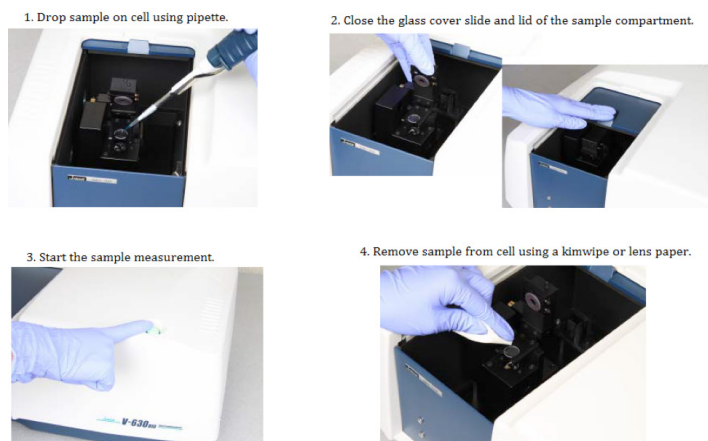
### Keywords

V-630BIO, UV-Visible/NIR, Biochemistry, SAH-769 One Drop, Microsampling

### Experimental

Measurement Conditions			
Wavelength	260 nm	Bandwidth	1.5 nm
Response	Medium		

A drop of sample was dispensed, measured, and repeated 10 times. The sample was wiped from the cell in between measurements. The procedure can be seen in Figure 1.



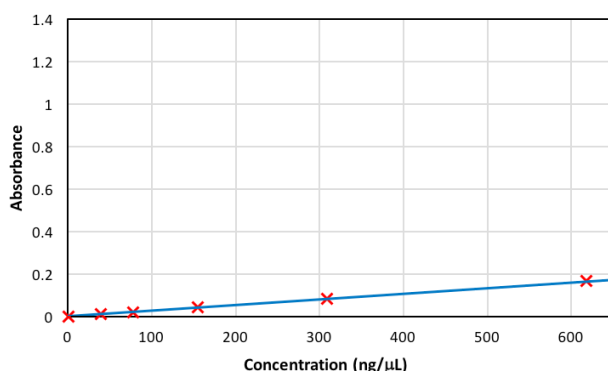
**Figure 1.** Measurement procedure using the SAH-769 One Drop accessory.

## Results

The absorption values obtained in a 1 mm pathlength cell are shown in Table 1 and the calibration curve in Figure 2. Table 2 illustrates the reproducibility of the concentration values calculated from the absorbance data.

**Table 1.** SAH-769 absorbance measurement reproducibility using a 1 mm pathlength cell.

ng/ $\mu$ L	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
Avg.	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



**Figure 2.** Calibration curve created using data from Table 1. The calibration equation is:  
Abs = 0.00163 x Conc. + 0.00366 and the correlation coefficient is 0.9998.

**Table 2.** Concentration reproducibility using a 1 mm pathlength cell.

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	19.	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
Avg.	-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: 50 ng/μL

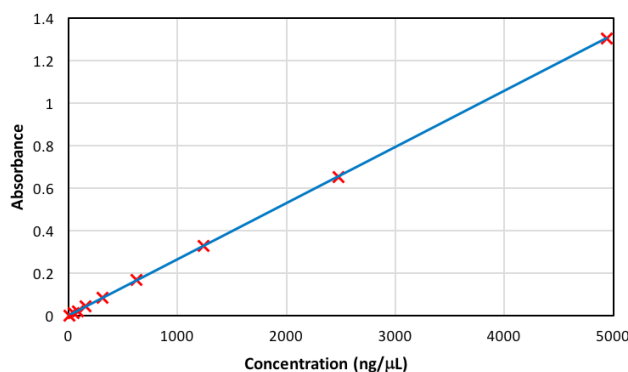
\*Quantitation limit: 100 ng/μL

The absorption values obtained in a 0.2 mm pathlength cell are shown in Table 3 and the calibration curve in Figure 3. Table 4 illustrates the reproducibility of the concentration values calculated from the absorbance data.

**Table 3.** SAH-769 absorbance measurement reproducibility using a 0.2 mm pathlength cell.

ng/ $\mu$ L	0	38.6	77.2	154.4	308.8	617.5	1235	2470	4940
1	0.0008	0.0122	0.0196	0.0460	0.0842	0.166	0.326	0.646	1.297
2	-0.0011	0.0165	0.0223	0.0430	0.0847	0.166	0.330	0.645	1.319
3	-0.0001	0.0160	0.0195	0.0427	0.0873	0.170	0.328	0.653	1.320
4	-0.0004	0.0112	0.0176	0.0430	0.0863	0.165	0.331	0.654	1.284
5	0.0069	0.0152	0.0180	0.0410	0.0860	0.168	0.327	0.647	1.307
6	-0.0005	0.0139	0.0184	0.0424	0.0845	0.170	0.326	0.660	1.303
7	0.0006	0.0137	0.0206	0.0450	0.0839	0.170	0.331	0.659	1.312
8	0.0019	0.0127	0.0200	0.0440	0.0875	0.168	0.330	0.658	1.301
9	0.0011	0.0130	0.0212	0.0435	0.0851	0.169	0.338	0.663	1.296
10	0.0007	0.0134	0.0194	0.0426	0.0879	0.171	0.326	0.664	1.308
Avg.	0.0010	0.0138	0.0197	0.0433	0.0857	0.168	0.329	0.655	1.305
S.D.	0.0012	0.0017	0.0015	0.0014	0.0015	0.0020	0.0037	0.0071	0.0110
C.V. %	N/A	12.2	7.4	3.3	1.7	1.2	1.1	1.1	0.8

The absorption values obtained in a 0.2 mm pathlength cell are shown in Table 3 and the calibration curve in Figure 3. Table 4 illustrates the reproducibility of the concentration values calculated from the absorbance data.



**Figure 3.** Calibration curve created using data from Table 3. The calibration equation is:  
 $Abs = 0.00264 \times Conc. + 0.00281$  and the correlation coefficient is 0.9999.

**Table 4.** Concentration reproducibility using a 0.2 mm pathlength cell.

ng/ $\mu$ L	0	38.6	77.2	154.4	308.8	617.5	1235	2470	4940
1	0.0008	0.0122	0.0196	0.0460	0.0842	0.166	0.326	0.646	1.297
2	-0.0011	0.0165	0.0223	0.0430	0.0847	0.166	0.330	0.645	1.319
3	-0.0001	0.0160	0.0195	0.0427	0.0873	0.170	0.328	0.653	1.320
4	-0.0004	0.0112	0.0176	0.0430	0.0863	0.165	0.331	0.654	1.284
5	0.0069	0.0152	0.0180	0.0410	0.0860	0.168	0.327	0.647	1.307
6	-0.0005	0.0139	0.0184	0.0424	0.0845	0.170	0.326	0.660	1.303
7	0.0006	0.0137	0.0206	0.0450	0.0839	0.170	0.331	0.659	1.312
8	0.0019	0.0127	0.0200	0.0440	0.0875	0.168	0.330	0.658	1.301
9	0.0011	0.0130	0.0212	0.0435	0.0851	0.169	0.338	0.663	1.296
10	0.0007	0.0134	0.0194	0.0426	0.0879	0.171	0.326	0.664	1.308
Avg.	0.0010	0.0138	0.0197	0.0433	0.0857	0.168	0.329	0.655	1.305
S.D.	0.0012	0.0017	0.0015	0.0014	0.0015	0.0020	0.0037	0.0071	0.0110
C.V. %	N/A	12.2	7.4	3.3	1.7	1.2	1.1	1.1	0.8

\*Detection limit: 50 ng/ $\mu$ L

\*Quantitation limit: 100 ng/ $\mu$ L

\*The detection limit is calculated using  $3.3\sigma$ . The quantitation limit is calculated using  $10\sigma$ .  $\sigma$  is the standard deviation in 0 ng/ $\mu$ L of sample concentration.