Sample Surface Cleaning

Technical Note 110

Introduction

The DeNovix® DS-11 uses a hydrophobic sapphire window along with a stainless steel and quartz optical fiber as sampling surfaces. Wiping the sample from both the upper and lower sampling surfaces with a dry lap wipe after a measurement is generally sufficient to completely remove any trace of the previous sample. However, if a sample is not adequately wiped away and dries down onto the surfaces, problems with subsequent measurements will occur.

Performing a Blank measurement on a dirty sampling surface (either top, bottom, or both) will result in erroneous absorbance values such as a negative spectrum (fig. 1) or sample concentrations being calculated as lower than the actual values (fig 2). Examples are shown below:

Figure 1: Protein dried onto the sample surface. The Blank was performed before cleaning resulting in a negative spectrum for the sample.

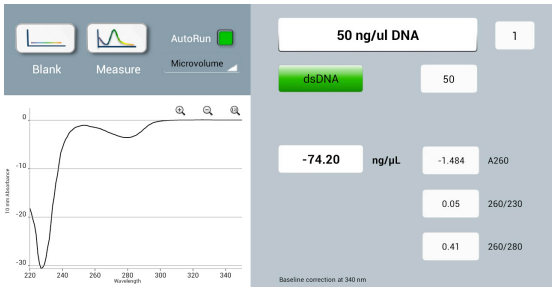
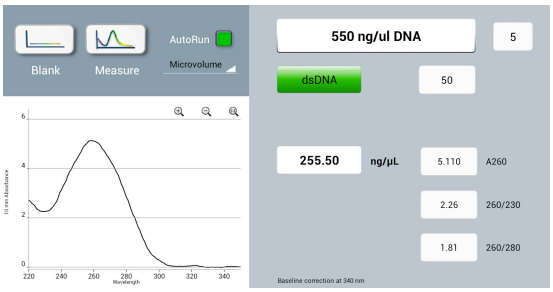


Figure 2: A DNA sample was wiped from the lower sample surface only. A new Blank was performed using dH_2O. A fresh DNA aliquot was then measured and the reported concentration was ~200 ng/µL below target.



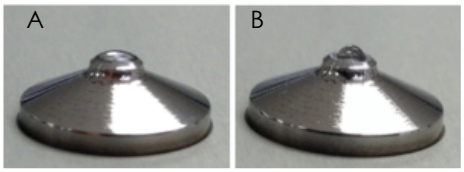
Sample Surface Cleaning Procedure

If sample concentrations are negative or lower than expected, follow the cleaning procedure below:

1. Pipette 2 µL of purified dH_2O onto the lower sampling surface and lower the arm.
2. Allow the dH_2O to sit between the sampling surfaces for approximately 15 seconds.
3. Lift the arm. Using a clean dry laboratory wipe, polish both the upper and lower sampling surfaces going back and forth several times on each with a moderate amount of force.
4. Measure a fresh aliquot of the blanking solution (water, or buffer) and confirm that there is not any significant absorbance across the spectrum.

If protein or bacterial cell culture sample has been left on the sampling surfaces of the DS-11, the surfaces may become unconditioned. In this case the sample will lie flat instead of beading up on the surface as seen in the figures 3a and 3b.

Figure 3: A. 1 µL of dH_2O lays flat on a dirty surface with a dried down protein sample. B. 1 µL of dH_2O will bead up when the surface is properly cleaned.



Dried on proteins can be difficult to clean with purified dH_2O alone. It is acceptable to substitute 0.5 M HCl in the place of water in the procedure above.

- After wiping away the HCl repeat the procedure above with dH_2O to ensure no residual acid is left on the microvolume sample surfaces.
- Do not use alcohols or bases to clean the DS-11 microvolume sample surfaces.

Note: The sampling surface is located near the front of the instrument. The optical surface at the back near the arm hinge base should be cleaned as described above if someone inadvertently pipettes samples onto this surface.

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