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.

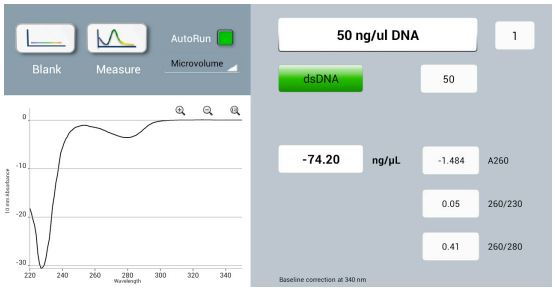
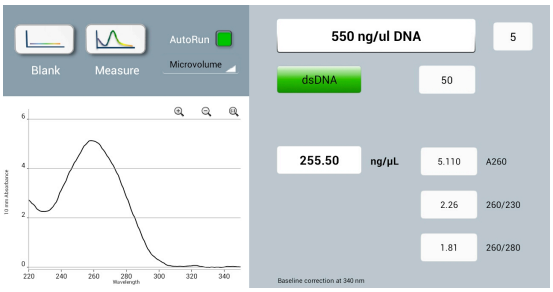


Figure 2: A DNA sample was wiped from the lower sample surface only. A new Blank was performed using dH_2O. A fresh DNA aliquot was then measured and the reported concentration was ~200 ng/µL below target.



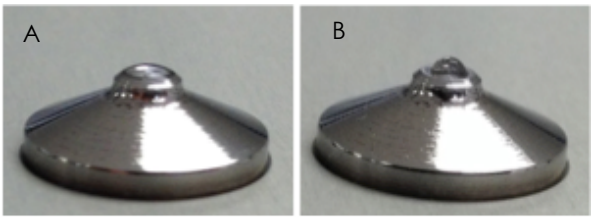
Sample Surface Cleaning Procedure

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 H2O 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, buffer etc.). Confirm that there is not any indication of a noticeable negative spectrum as seen in figure 1.

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 3 and 4 below.

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 H2O 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.

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