

Overcoming trapped vapours in the Pearl™

Blow away volatiles with the Specac-Puffer

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THE PEARL™ ACCESSORY ALLOWS users to record IR spectra of liquid samples quickly and easily. Samples are loaded into an internal liquid cell called the Oyster Cell, which opens and closes like an oyster, allowing the user to quickly load and unload samples as well as clean the cell.

If a sample is left within the Pearl™ after analysis, some of it will leak over time, particularly volatile samples like acetone. However, this note demonstrates that any trapped volatile vapours can be evacuated effectively by blowing air through the purge hole of the Pearl™ using a hand held puffer.

Methods & results

A 50 µm pathlength cell was filled with 20 µl of acetone and then placed inside the Pearl™ for 20 seconds, to allow leaked vapours to fill the unit.

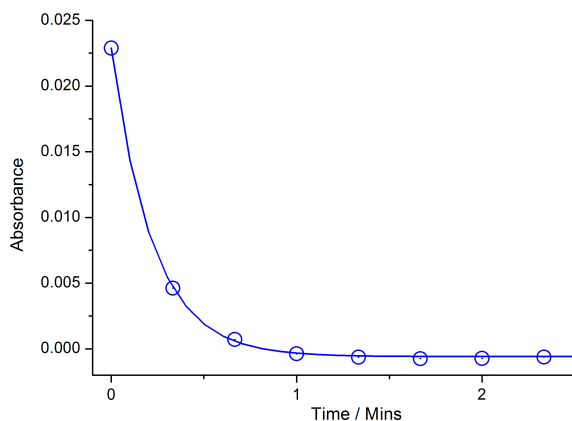


Figure 1: time-dependence of Acetone vapour signal



Specac-Puffer supplied with the Pearl™

The cell was then removed and an IR spectrum of the empty Pearl™ was taken to establish the presence of any acetone vapour.

Subsequent IR spectra were recorded in 20 second steps and air was puffed into the Pearl™ in between each recording.

The very fast removal of trapped vapours was determined by monitoring the time-dependence of the acetone absorption band at 1740 cm^{-1} , shown in Figure 1.

Clearly, 80% of the vapour disappears after 20 seconds and after a minute there is practically no acetone left, as a result of blowing air into the Pearl™.

The best procedure to minimise trapped vapours is to limit how long the sample is inside the Oyster Cell.

When a spectrum is recorded, the sample should be removed and the cell should be wiped with lens tissue, one which is wetted with an appropriate solvent.

Afterwards, thoroughly wipe away any solvent from the cell with new lens tissue and leave the cell open for one minute.

Several short bursts of air from a puffer over the dried cell windows should eliminate any lingering vapours.

The exact amount of volatile vapour in the Pearl™ depends on amount of sample used and the duration it is left inside the cell. The time needed to evacuate the Pearl™ varies but should not normally exceed 5 minutes.

The user may wish to purge the Pearl™ unit via an air, nitrogen or vacuum line for an even faster way of removing lingering vapours. In such cases, the Oyster cell should be removed from the Pearl™ first.

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