



It's simply breathtaking
Made in Sweden

Sample Preparation Procedure

Exhaled breath constitutes an attractive specimen for forensic and medical investigations. Compared to alternative methods, exhaled breath is always readily accessible, and sampling is both convenient for the donor and non-invasive in nature. Exhaled breath may contain as many detectable components as blood or urine. There are already several FDA approved breath-related tests, but for volatile compounds.

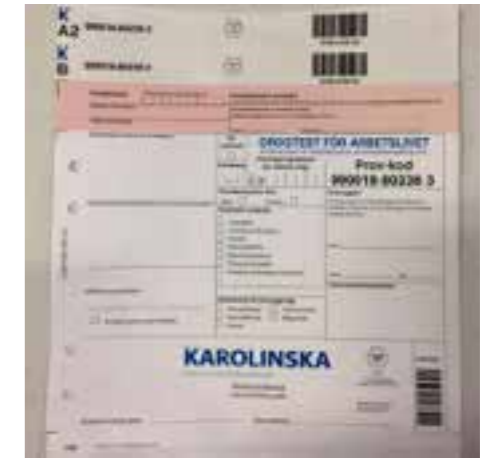
Exhaled breath contains both volatile and non-volatile compounds. The part that contains the non-volatile components is present in the form of aerosol particles. Particles of sizes about 1 μm in diameter, most of them $<1 \mu\text{m}$ in diameter, are always present in human breath. These particles are formed during inhalation, when the small airways re-open and the lining fluid bursts. The particles consist of surfactant, a liquid that is secreted in the distal airways and is crucial for lung function. The exact surfactant composition is functionally important and complex, and consists of lipids, mainly phospholipids, and proteins. Both the proteins and the lipids are considered important for mechanical and protective functions. Both components may be affected by disease. Thus, surfactant is an interesting source of potential biomarkers.

In 2010, the detection of amphetamine in exhaled breath at about 24 hours after intake was reported. This initiated a new set of work that has explored drug breath testing further. The potential for this new drug testing technology was illustrated by a study of illicit drug users recovering from acute intoxication. Actual drug intake was determined on the basis of self-report, plasma and urine analysis. The results demonstrated that all studied drug substances were detected in the collected exhaled breath samples at the time they were clinically recovered.

Text by: Prof. Olof Beck
Karolinska Institute



1. BE Sampling Device packaged in a bag that is sealed off with a sample ID label that corresponds to the chain of custody document.



2. Request form provided by the accredited laboratory.



3. Another possible way of labelling the device.



4. Set of tools for manual preparation.



5. If necessary, cut the label along the rim of the large cap that covers the mouth piece.



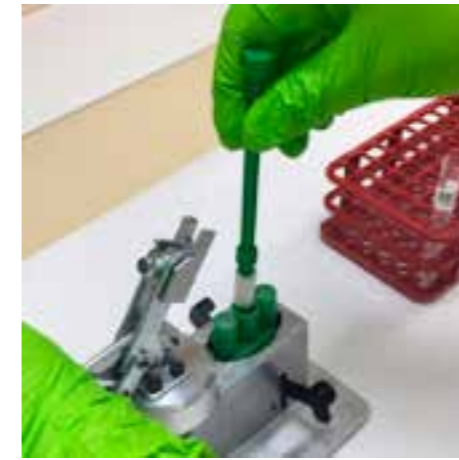
6. Remove the large end cap and dispose of it for destruction.



7. Apply the device to the disassembly tool.



8. Push down on the device until a "click" sound is heard, and the device remains down.



13. Release the pressure and remove the Pick Stick, now holding the collector (A sample).



14. Put the stick with the A-sample collector in a glass test tube.



9. It is now possible to remove the cover and dispose of it for destruction.



10. Now the three collectors are visible.



15. Place the mouth piece, including the B&C-sample collectors, in the cradle (in which there are already two plastic test tubes for freeze storage).



16. Turn the cradle over.



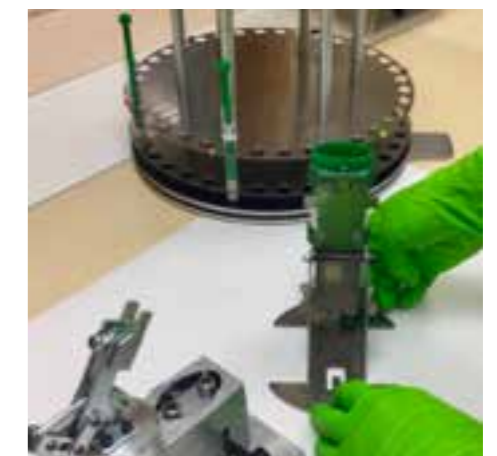
11. Apply the Pick Stick and turn gently until you feel the stick grip to the collector.



12. Use the handle to push down on the Pick Stick so that it is attached to the collector.



17. If the collectors do not fall out, use the Poke Stick and push the B&C samples into the tubes.

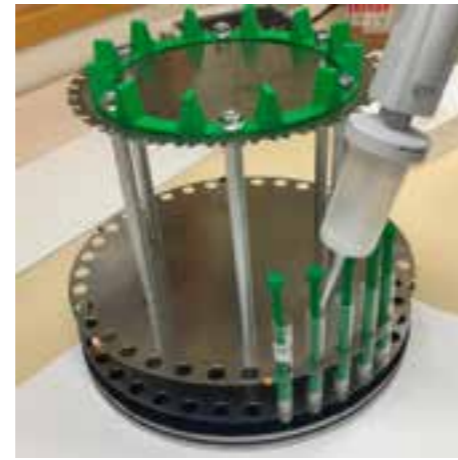


18. ID-label the glass tubes, which are then preferably put into the BE carousel.

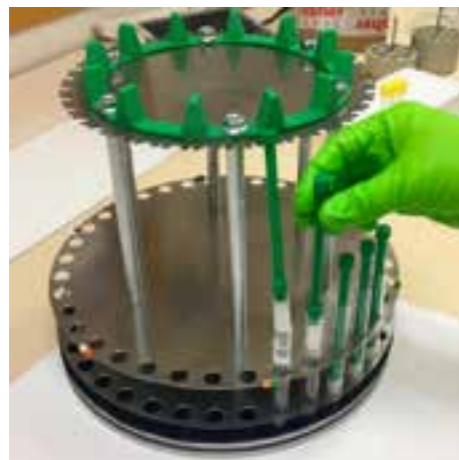
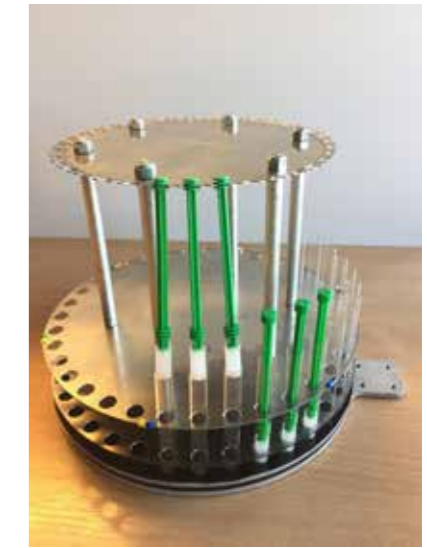
Manual Preparation Tools



19. For safe storage, put caps and ID labels on the plastic tubes for the B & C samples.

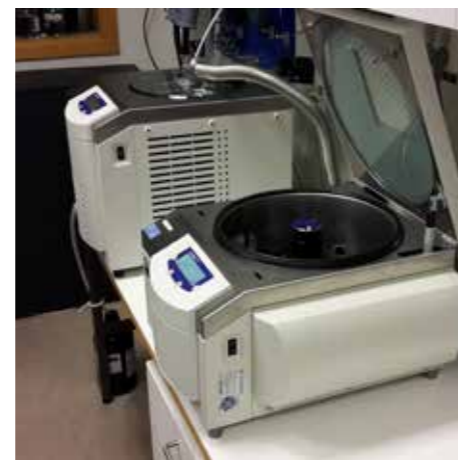


20. Add the methanol (alt. buffer) extraction solution containing internal standards.

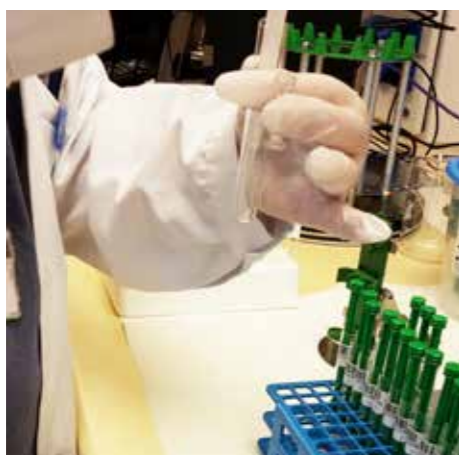


21. Stir the collector Stick for a few seconds each or vortex.

22. Remove the Stick holding the collector. Make sure most solvent is left in the glass tube.



23. Evaporate extract to dryness using a vacuum centrifuge.



24. Redissolve in LC-buffer and transfer to autosampler vial.



25. Load vials. Perform LC-MS/MS analysis.

Collaborative Robot Automation

