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Title: Standardization procedures for in-vitro measurements using differential ion mobility spectrometry (DMS)

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Body: Introduction Air contains a couple of non-gaseous volatile organic substances (VOCs). Differential Ion Mobility Spectrometry (DMS) is an analytical method for detection of VOCs with sensitivity in the ppt-range and the possibility of processing native steam-containing samples. A common problem is the pollution of samples by environmental agents, even with similar VOCs as in the samples. The method already was used for detection of bacterial growth. Methods For evaluation of ambient air influences on standardized in-vitro samples, bacteria-breeding grounds in closed vials were measured with room air as well as with filtered room air. This method should keep the water-content of the samples unchanged. The spectra were analyzed by a statistical program based on cluster analysis. Results The evaluation included up to 120 clusters of peaks. The number of peaks in filtered pure room air was significantly reduced and the total intensity was about halved. The reactant ion peak (RIP) of room air was 1.5-fold increased. Peaks and total intensity of the measured breeding grounds remained virtually unchanged. Discussion The filtering of air was capable to reduce environmental pollutants of in-vitro DMS measurements, even if the sample contains ambient air itself. The RIP of the sample tracings remains unchanged or was slightly increased, which can improve the sensitivity of DMS-measurements. The investigation shows that it is possible to dispense with expensive carrier gases, what allows inexpensive diagnostic measurements in a contaminated environment.