

Fig. 2 Theoretical evolution of the concentration of a gas being emitted from the soil upon use of a static chamber. Concentration of the gas above the soil surface (black line) remains at a relatively constant level; at the moment when the chamber is closed (left arrow), the concentration in its headspace begins to rise. Along the closing period of the chamber, several gas samples are taken (black squares) and subsequently the concentration is determined, e.g. by use of gas chromatography. Right after opening the chamber (right arrow) concentration above soil surface returns to atmospheric background levels. Soil GHG emissions are most commonly calculated from the linear increase of the headspace gas concentration during the chamber closing period (red line), the volume of the chamber, the area of the soil covered by the chamber, as well as air temperature, air pressure and molecular weight of the molecule under investigation (see e.g. Butterbach-Bahl et al., 2011). It should be noted, that changes in gas concentration upon chamber closure can significantly deviate from linearity, showing e.g. saturation effects. In all cases it should be tested if non-linear flux calculation methods to not fit better observed changes in chamber headspace concentrations with time (see e.g. Pedersen et al., 2010)

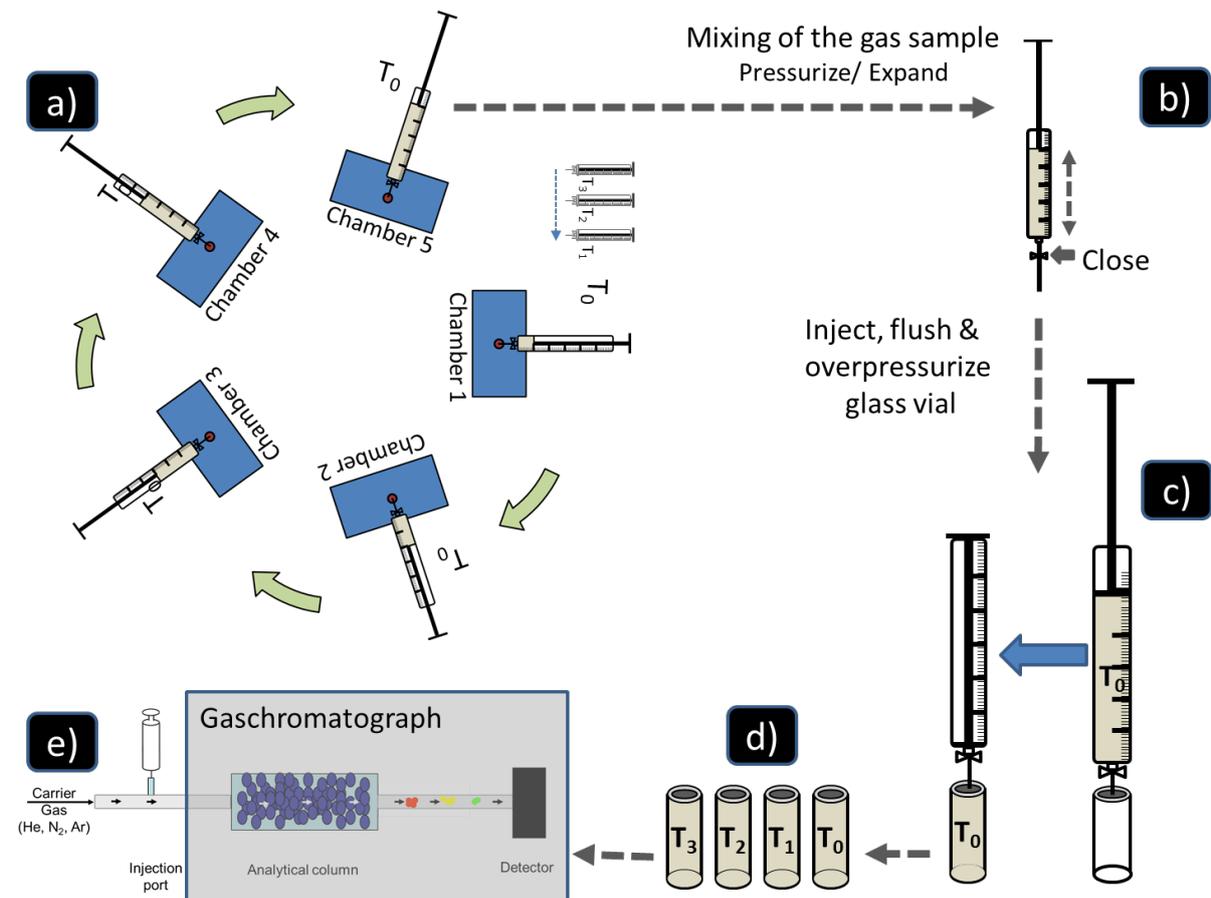


Fig. 3 The concept of gas pooling. a) Gas pooling across chambers for a given sampling time, b) gas sample mixing within the syringe, c) transfer of the gas sample to a vial, d) 4 vials for four sampling times and 5 chambers, e) air sample analysis via gas chromatography (for further details see Arias-Navarro et al., 2013)

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