

**AN APPROACH TO THE DETERMINATION OF AVERAGE
AIRBORNE CONCENTRATION OF CO₂, BY MEANS OF A LONG-TERM DIFFUSIVE
SAMPLING DEVICE**

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A diffusive sampling device, exploiting a tube-type geometry of the diffusion path, is proposed for long-term determination of average airborne concentration of CO₂ in urban and industrial areas, so as in indoor sites. A hydro-alcoholic barium hydroxide solution is employed as a CO₂ reagent sink. The analytical connected method is based on the determination of the solute barium hydroxide remaining after the acid-base reaction, in which its insoluble carbonate salt precipitate. Some indoor laboratory experiments show that, this technique exhibits a good precision and reproducibility. A six-week internal consistency test demonstrate that this device has a constant uptake rate, allowing proposing it as a suitable and inexpensive tool in performing the monitoring of urban and industrial sites over long periods and in indoor-outdoor studies, like those involved in the sick-building syndrome problem. In last years some governments of important cities promoted regional and local studies in this field and results showed that CO₂ values of twice the background value (about 370 $\mu\text{mol/mol}$) are not unusual at the urban centres of the main cities, where a “dome effect” has been highlighted. Preliminary results of a monitoring campaign performed in the city of Rome (Italy) are also shown.