

CONSTRUCTION OF A LOW COST AIR SAMPLER AND IT'S APPLICATION IN SAMPLING VOLATILE CARBONYL COMPOUNDS

K I A Kularatne and K R Ranjith Mahanama
University of Colombo.

Interest is expanding in measuring concentrations of volatile organic compounds in buildings since it is recognised that many peoples' exposure to these compounds occur in the indoor environment. However, such data are not available in Sri Lanka primarily due to lack of proper equipment for quantitation and their high maintenance cost. This paper describes the construction of a low cost air sampler (Rs. 400/=) using commonly available materials.

The air sampler contains a muffler fan to pull ambient air through a filter(s) and/or a bed of sorbent material, which are housed in a variable length PVC tube. Battery powered muffler fan and lightweight are two of the convenient features of this air sampler that minimise operational and transportation difficulties to the user.

Volatile carbonyl compounds such as formaldehyde acetaldehyde and acetone are commonly found in indoors ambient air due to the combustion sources and emissions from synthetic household products. Since formaldehyde is a known carcinogen and acetaldehyde is a suspected carcinogen compound, they were selected as the model compounds for the evaluation of constructed sampler. A filter paper spiked with 2, 4-dinitrophenylhydrazene is used to collect the airborne carbonyl compounds at a flow rate of 1.8 cm³/sec. Filters were sonicated in methanol and extracts were separated using a C₁₈ column for quantitation at 350 nm wavelength. Quantitation limits estimates that sampling of 10 dm³ ambient air enables minimum quantitation of 0.5 formaldehyde, 1.0 acetaldehyde and 1.2 acetone accurately. The paper also reports quantified levels of airborne carbonyls from different indoor environments.