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Chemical Characterization of the Indoor Air Quality of a University Hospital: Contribution of Outdoor and Indoor Sources of Air Pollutants

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Local outdoor sources of air pollution may become a threat to indoor air quality (IAQ). The aim of this study was to find out if local outdoor sources of air pollution have an impact on the IAQ of a hospital. We characterized emissions from a helicopter and from emergency power supplies as suspected causes of odor complaints. IAQ was characterized over a period of two weeks at eleven indoor locations and at the helicopter platform and power supply. Volatile organic compounds (VOC), formaldehyde, nitrogen dioxide (NO_2), respirable particulate matter (PM-4.0) and their benz[a]pyrene (B[a]P) contents were determined. NO_2 and formaldehyde concentrations were similar on indoor and outdoor locations. Elevated of VOC concentrations were related to infection control and laboratory practices. PM-4.0 concentrations were lower in buildings serviced with air filtered by a >99.95 % efficiency particle filter, compared to buildings using a standard 80-90 % efficiency filter ($p < 0.01$) and no B[a]P was detected. Chemical IAQ was primarily driven by known indoor sources and activities.