# Sensory Evaluation of Indoor Air Pollution Sources

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Abstract  The basic biological principles of the perception mechanisms for odour and irritants are fairly well understood. Much more uncertain is how these basic processes relate to the more complex psychological responses of odorant/irritant stimulation. Techniques to evaluate air quality with humans are based on measurable attributes such as detection, intensity and quality. The indoor environment comprises thousands of chemical compounds in low concentrations, of which not all can be measured and interpreted by currently available equipment. The nose can detect very low concentrations (parts-per-trillion range) and interpret all at the same time. Besides tobacco smoke, if smoking is allowed, the major indoor air sources comprise furnishings and ventilation systems. Through emission testing of products in laboratory situations, prediction of indoor air qualities in real environments should become possible. However, as long as no unambiguous unit as an indicator for perceived air quality exists, dose-response relations are difficult and labelling even more so.

Keywords  Indoor air · Pollution sources · Sensory evaluation

Abbreviations
ECA European Concerted Action
HVAC Heating Ventilation and Air Conditioning
IAQ Indoor Air Quality
IPF Individual performance factor of panel member (%)
LUR Lifetime unit risk
PAP Perceived air pollution
TVOC Total volatile organic compound
VOC Volatile organic compound

1 Introduction

From the occupant’s point of view, the ideal situation is an indoor environment that satisfies all occupants (i.e. they have no complaints) and does not unnecessarily increase the risk or severity of illness or injury. Both the satisfaction of people (comfort) and health status are influenced by general well-being, mental drive, job satisfaction, technical competence, career achievements, home/work interface, relationship with others, personal circumstances, organisational matters, etc, and last but not least by environmental factors, such as

- Indoor air quality (IAQ): comprising odour, indoor air pollution, fresh air supply, etc.
- Thermal comfort: moisture, air velocity, temperature, etc.
- Acoustical quality: noise from outside, indoors, vibrations, etc.
- Visual or lighting quality: view, illuminance, luminance ratios, reflection, etc.
- Aesthetic quality.

These environmental factors greatly depend on the performance of the enclosure, as well as on the interaction between the human being and the enclosure. People are exposed during more than 90% of their life to these factors in enclosed spaces. Human assessment of the environment is basically expressed