Indoor Air Quality and Thermal Comfort, in Irish Retrofitted Energy Efficient Homes

Speaker and affiliation

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Overview of the presentation

Results from an Irish study comparing the concentrations of 10 indoor air pollutants and occupant comfort in 15 naturally ventilated three bed semi-detached two storey homes before and after the implementation of energy efficient retrofit will be presented.
As part of the energy retrofit homes received new windows and doors, an upgraded heating system, attic insulation, and wall vents along with pumped beaded wall insulation into the wall cavity. The energy upgrades resulted in building air tightness levels increasing from 9.26 $m^3/h.m^2$ to values of between 5.53 $m^3/h.m^2$ and 8.61 $m^3/h.m^2$.
Temperature and relative humidity (RH), along with concentrations of benzene, toluene, ethylbenzene, xylene, TVOCs, $PM_{2.5}$, CO_2, and CO were measured over a 24-hour period in the main living area and main bedroom of each home. Concentrations of NO_2 and formaldehyde were measured in the living room only. Contextual information regarding the household and occupant activities such as when the heating system was used during the monitoring period was collected using occupant diaries and questionnaires.