Assessment of indoor air quality in a beauty salon

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Introduction

In Europe, more than one million individuals are employed in the hairdressing sector with over 80% women workers (EU-OSHA, 2014). Hairdressers handle a vast array of chemicals through the use of cosmetics such as shampoos and hair conditioners, hair colorings, bleaching/lightening products, perming and curling products and hair sprays, among others. The products and treatment techniques used in beauty salons can put both the salon technicians and clients at risk of exposure to hazardous chemicals. A one-week sampling campaign was conducted in a hairdresser salon in the city of León, Spain.

Methods

Indoor PM10 levels were largely affected by indoor sources, since the calculated I/O ratios were much higher than 1 during the occupancy period.

Good correlation was found between PM10 concentrations and the number of female customers ($R^2 = 0.8052$) and between CO2 and the total number of clients attending the salon ($R^2 = 0.721$).

Indoor formaldehyde concentration was below the short-term guideline (0.1 mg m$^{-3}$) recommended by WHO to prevent sensory irritation.

Temperatures are high enough to be consistent with a high rate of release of formaldehyde from the hair care products used in the beauty salon.

Conclusions

- Temperature recorded throughout the sampling campaign was not within the ASHRAE comfort zone in the winter season (20 – 23 °C).
- Good correlation was found between PM$_{10}$ concentrations and a number of female customers ($R^2 = 0.8052$) and between CO$_2$ concentrations and the total number of clients attending the salon ($R^2 = 0.721$).
- Indoor formaldehyde concentration was below the short-term guideline (0.1 mg m$^{-3}$) recommended by WHO to prevent sensory irritation.
- Indoor PM$_{10}$ levels were largely affected by indoor sources, since the calculated I/O ratios were much higher than 1 during the occupancy period.
- Inorganic ions had low contribution to the PM$_{10}$ mass during the occupancy period (2.72 %w/w) increasing over night (12.4 %w/w). The carbonate matter had larger contribution, representing 34.1 and 28.7% w/w of the particulate mass during the occupancy and non-occupancy period, respectively.