VOCs in indoor environments: insights from a detailed chemical model

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This paper will report recent insights from a detailed chemical model for indoor air chemistry, the INDCM (the INdoor Detailed Chemical Model). The INDCM model has been used over many years to understand the key chemicals and processes that affect indoor air quality. In particular, volatile organic compounds (VOCs) play a crucial role, both in terms of primary emissions from human activities (e.g. cleaning and cooking), as well as following transformation processes such as interactions on indoor surfaces following ozone deposition. In addition, the model has been used to study how human occupancy changes indoor air quality through emissions from skin and breath. For all of these processes, the role of VOCs is key. In addition, many of these processes transform relatively benign primary emissions to much more harmful secondary species (e.g. formaldehyde and nitrated organic material). We will present the main findings from our work highlighting the important role of VOCs indoors and also, the conditions (e.g. ventilation and lighting) when they become most important. Understanding these transformation processes indoors is more important than ever, given recent findings that suggest that use of VOCs indoors will likely impact outdoor chemistry too.