Humans on average spend 90% of their lifetimes indoors and are exposed daily to volatile organic compound (VOC) concentrations that are 1-2 orders of magnitude greater than ambient levels. A large portion of chemical emissions indoors are related back to building materials like carpet, drywalls and paints. House dust, a complex matrix of organic and inorganic materials, accumulates on these building materials and at elevated relative humidity (RH) can support microbial growth. Microbial VOCs are released during metabolic processes, leading to two possible sources of VOCs coming off a singular surface(s). However, the relationship between the relative humidity in air and VOCs and mVOCs emissions is not well understood. Emissions from carpet only and house dust embedded in carpet were determined by using a proton-transfer-reaction time of flight mass spectrometer (PTR-TOF-MS) which measured the emissions profile across an RH range of 50-95%. Unique profiles were observed at each RH, demonstrating the considerable effect of RH on material emissions themselves. At elevated RH the microbial contribution was evident by the release of compounds like dimethyl sulfide and a suite of monoterpenes for the carpet embedded with dust. Future work may elucidate efforts to detect microbial growth indoors utilizing mVOCs.

Implications of Social Distancing Policies on Municipal Water Quality

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During the COVID-19 pandemic, a number of social distancing policies (SDPs) were implemented throughout the US leading to abrupt changes in the daily activity of businesses and communities. Along these SDPs, spatiotemporal changes in water demand were expected such as shift in water demand from publicly dense areas to residential areas. On the national scale, we performed semi-structured interviews with utilities throughout the US that document challenges experienced. On a local scale, we assessed water quality in Austin’s water distribution and analyzed water demand changes at UT’s campus. Results — both nationwide and in Austin — show that generally most utilities experienced improved or decreased water quality relative to status quo but were largely able to maintain regulatory standards. Using our results, we can formulate practical recommendations for utilities and communities as for future similar large-scale scenarios.