Aalto University
School of Engineering

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Indoor pollutions and detection methods

Title of the dissertation	Novel detection methods and knowledge of indoor emissions from building materials, fungi, and cleaning agents
Contents of the dissertation	To guarantee occupants' health, it is important to better understand exposure to indoor contamination and to improve detection methods. Abnormal moisture level can accelerate the degradation of building materials and promote mould growth. This research shows that it is more difficult to assess emissions from degrading new-generation PVC floor coverings. This hardens the detection of hidden moisture damage in the floor structure and could lead to more severe problems. Mould species characteristic of damp environment were isolated from problematic indoor spaces. These species produced microbial toxins on laboratory media and building materials. Yet, it is unknown how microbial toxins are transported in the indoor environment, but droplets could be a possible carrier of toxins. Two novel detection methods were evaluated, one for the screening of microbial contaminants and one for the detection of cleaning agents in the indoor air. The new computer-based assay could detect microbial contaminants with specific toxicity mechanisms. Better screening capacity, even limited to specific toxins, could greatly improve the knowledge on the presence of toxins in the indoor environment. The laboratory method proposed for detecting airborne cleaning agents was successful but not yet applicable for direct detection in real-life scenario.
Field of the dissertation	Indoor Environment Technology
Doctoral candidate	Emmanuelle, Castagnoli, M.Sc. (Chemistry)
Time of the defence	10.09.2020 at 12:00
Place of the defence	Aalto University School of Engineering, remotely via zoom link https://aalto.zoom.us/j/61129632137 Meeting ID: 611 2963 2137
Opponent	Professor Marzenna R. Dudzinska, Lublin University of Technology, Poland
Supervisor	Professor Heidi Salonen, Aalto University School of Engineering, Department of Civil Engineering.
Electronic dissertation	https://aaltodoc.aalto.fi/handle/123456789/49 *(permanent link to dissertation, if dissertation is already available in electronic form)*
School of Engineering electronic dissertations	https://aaltodoc.aalto.fi/handle/123456789/49
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