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## PASSIVE SAMPLING TECHNIQUES FOR A SCREENING OF POLYCHLORINATED BIPHENYLS (PCBS) IN INDOOR AIR

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### ABSTRACT

Polychlorinated biphenyls (PCBs) were used as insulating fluids in capacitors and transformers, as hydraulic fluids, and as plasticizer in various products until the 1970s/1980s. Their use in construction materials, such as joint sealants, double-glazed windows, flooring materials, paints etc. coincided with a period of high building activity in Denmark and probably elsewhere, leading to a potentially high number of buildings with PCB containing materials. Their emission to the indoor environment can result in elevated PCB levels in indoor air. The Danish Health and Medicines Authorities have issued action values of 300 and 3000 ng/m<sup>3</sup> for  $\Sigma$ PCB in indoor air, which require different levels of intervention. In this study, we used polydimethylsiloxane (PDMS, silicone) for the passive sampling of PCBs in indoor air. Laboratory experiments on the effect of varying air velocities at the sampler surface on elimination rates of PCBs showed changes of a factor of 1.4-2.8 for glasses with a layer of silicone in the bottom exposed to air flows of 0.1 and 0.3 m/s. This demonstrates potential implications for the accuracy of sampling rates. Two types of silicone-based passive samplers were tested for the collection of PCB in buildings: Petri dishes with a thin layer of silicone and silicone-coated paper. Time series showed linear uptake of PCBs over a week for the petri dish samplers, while the silicone-coated paper approached equilibrium within a week. The samplers were calibrated with concurrent active measurements. This resulted in sampling rates for CB-18, CB-52 and CB-101 for the petri dishes and additionally, CB-118 and CB-153 for the silicone-coated paper, here also used as a kinetic sampler. Applying these sampling rates, air concentrations were determined for five locations and compared with results from conventional active sampling. A tendency of overestimation was observed, but most measurements agreed within a factor of 2-3.