Modelling indoor emissions and fate of FRs

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Project outline: developing a modelling approach for assessing the indoor fate of "established" and "emerging" FRs (WP 1)

Main goals

1) identify key uncertainties in our understanding of sources and fate

2) develop exposure scenarios and

3) support exposure assessments of FRs

Multimedia indoor fate models

- Multi-compartment, mass-balance models
- Different phases considered, i.e gas phase & sorbed
- Emissions from treated goods, diffusive/advective transport processes, degradation/transformation processes
- Fugacity approach often used as a more convenient descriptor

Multimedia indoor fate models
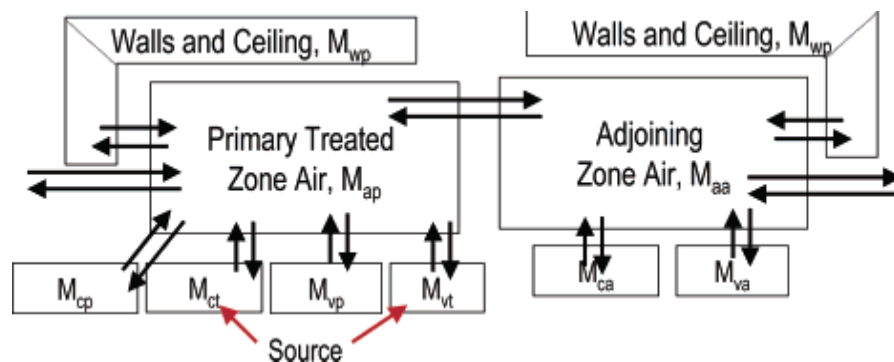
(Bennet and Furtaw, 2004)
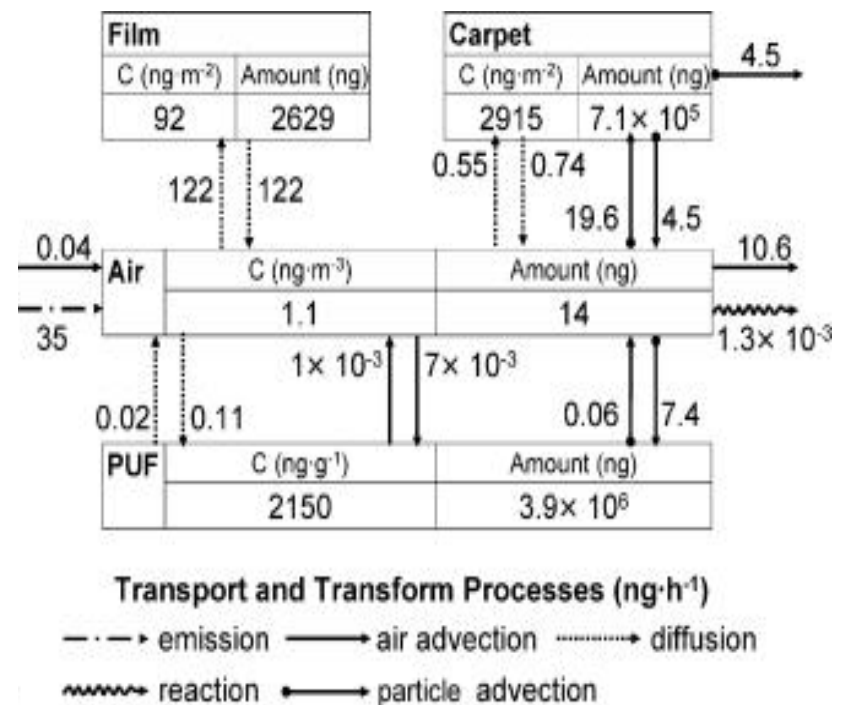
(Zhang et al., 2009)

Limitations - Challenges

Uncertainty associated with:

- Physico-chemicals properties (i.e. no or little contradictory information on most NBFRS)

- Extent and nature of partitioning and transport processes, i.e dust composition and movement, emissions from treated goods, partitioning vs diffusion into materials

- Effect of human activities

Compare model results with measured data!

Progress to date

- Theoretical training: **Modelling of Environmental Pollutants course** @ SU

- Reviewing and compiling information of physical-chemicals properties of BFRs

- Reviewing and comparing available approaches for modelling SVOCs in the indoor environment

Future plans

- Continue reviewing work - identify gaps in knowledge & possibilities for improvement

- Developing an approach for estimating appropriate values for physical properties of NBFRs – in collaboration with ITM's analytical scientists

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Future plans

- Develop, or adapt an existing, fugacity-based model of indoor fate and emission

- Model evaluation; analysing sensitivities/uncertainties of modelled parameters

- Visiting VITO and UB

- Optimize the indoor fate model using additional information from other INFLAME components

- Determining the source contribution of FRs in indoor air to outdoor air levels in collaboration with Seth Newton