

VOC - Wood and Health

Nordic seminar on the health effects of wood

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Als Mitglied des Fachverbandes vertreten bei



THE UNPLEASANT REALITY

- ➡ **Demolition of buildings:** because they were built of wood
- ➡ **Indemnity claims:** because furniture smells of wood
- ➡ **Regulatory restrictions:** e.g. in wellness areas (sauna)
- ➡ **Voluntary and mandatory assessment schemes:** *de facto* prohibition of wood and wood products, because they are assumed as dangerous and even carcinogenic
- ➡ **A construction company:** No use of resinous northern pine wood for outdoor constructions, "...because it is *poisonous...*"

VOC (VOLATILE ORGANIC COMPOUNDS) TVOC (TOTAL VOC)

- ☞ **VOC:** volatile organic compounds, synthetic oder natural origin
- ☞ **Definition:** inconsistent, differentiation by origin, boiling point ect.
- ☞ **Symptoms:** dose dependent
 - headache, dizziness, tiredness
 - irritation of eyes and airways
 - nausea, vomiting, general discomfort
- ☞ **Threshold:** ca. 3 mg/m³ (substance dependent)
- ☞ **TVOC:** sum of all VOC, independent of composition

TOXICOLOGY - A CRASH COURSE

RISK AND DANGER

- **Evolution:** Mankind evolved from creatures living in forests (with possibly high VOC emissions). So the species had millions of years to accustom itself.
- **Paracelsus:** The dose makes the poison (still valid).
- **Danger:** principal suitability to cause damage
- **Exposition:** probability to be exposed to that danger
- **Risiko:** calculated prognosis for a damage

$$\text{Risk} = \text{Danger} \times \text{Exposition} /$$

(Countermeasures)

- **So risk is relevant and not danger**
- **Without dose no risk! Without risk, no health effect!**
- **frequently:** unknown, confused, ignored, concealed ...

bad TVOC ???



Wikipedia, Wikimedia Commons

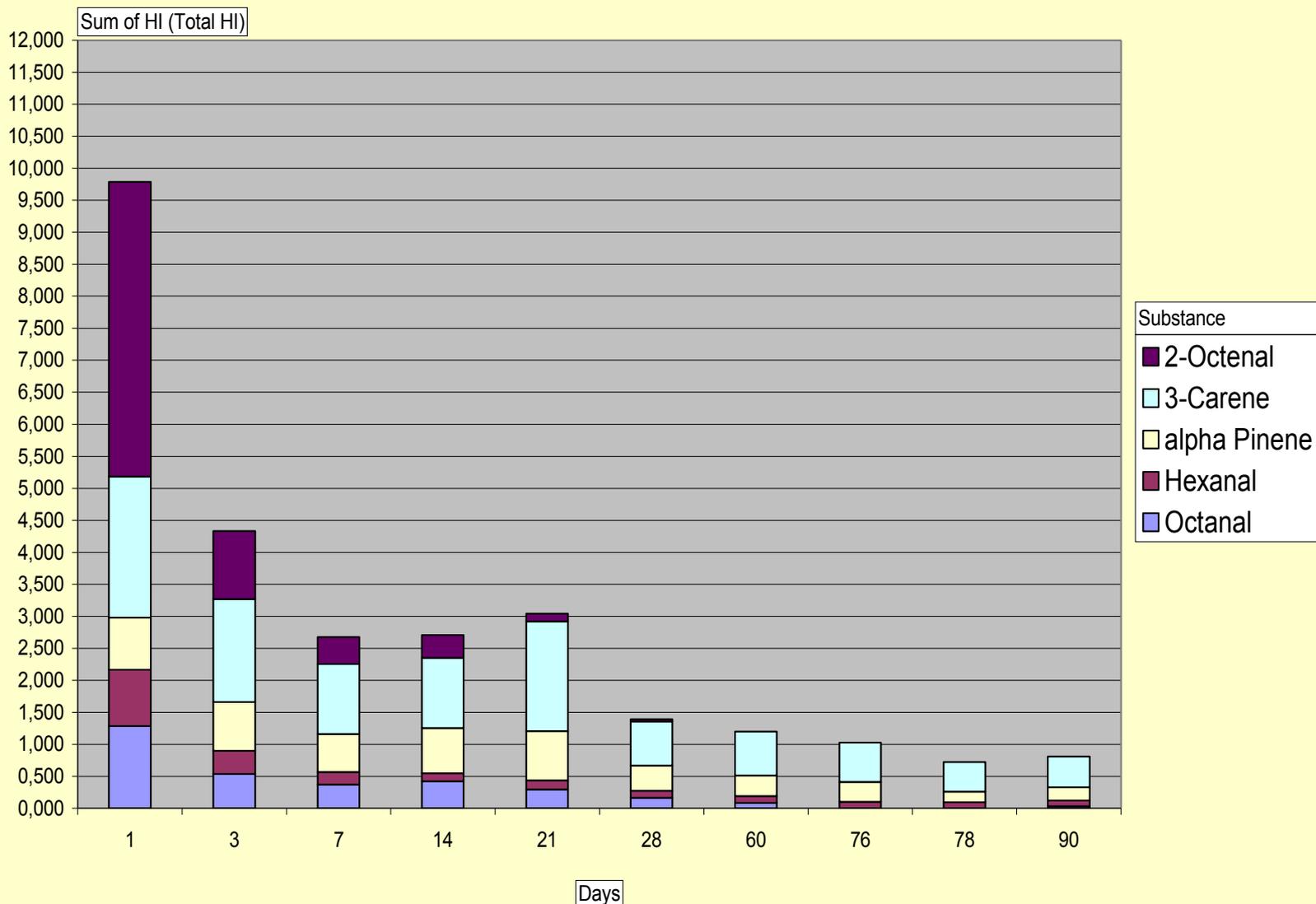
good TVOC ???



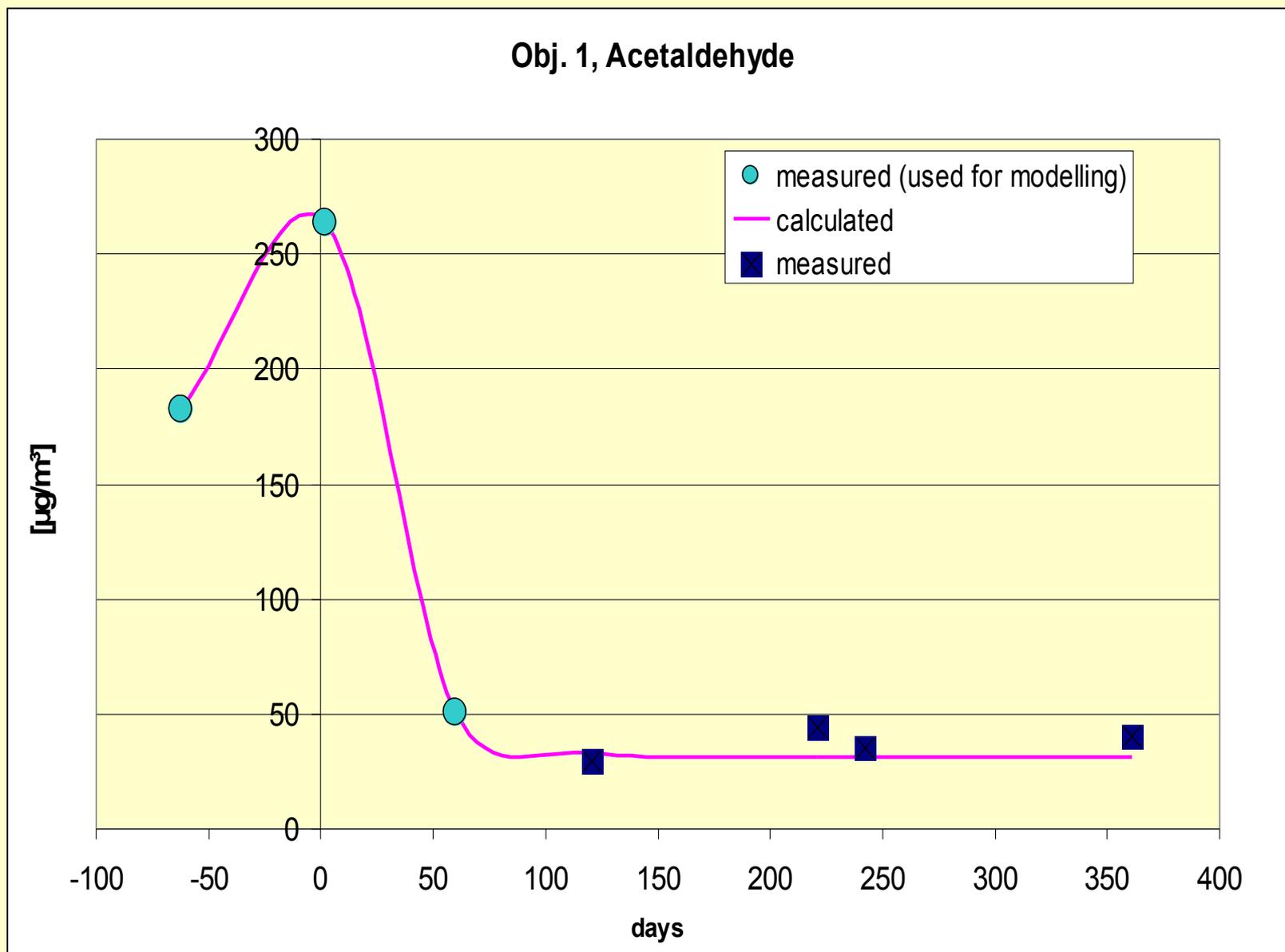
- 👉 **Wood VOC emissions: decline over weeks and months (up to 6)**
- 👉 **Mandatory assessment schemes using 28 days: not suitable for the longterm emission prognosis of wood and wood products**
- 👉 **Prognosis of longterm emission behaviour: can be prognosed rather accurately with a few measurements in the first weeks using a model developed in a project**
- 👉 **EN16516 emission testing: material emission can depend on chamber size !!!, i.e. the smaller the chamber, the higher the specific emissions => hard to derive real live conditions from such measurements**
- 👉 **Other heavy influences on emissions: modifications of the interior and user behaviour**

RESINOUS WOODS ASSESSED BY TIAC SCHEME

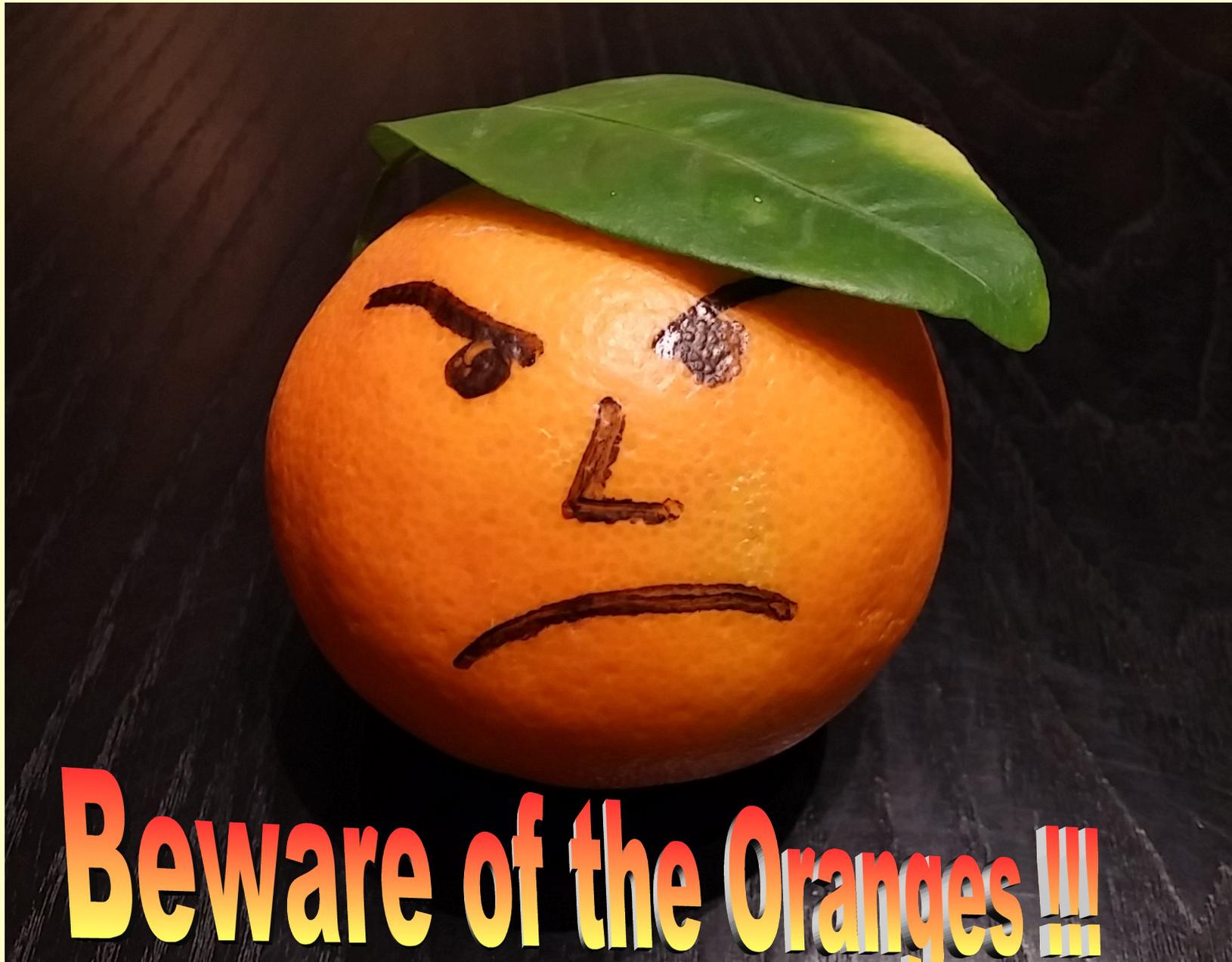
Sample (Alle)



EMISSION MODEL - REAL DATA VS. MODEL



- ➡ **TIAC-System:** developed during a project, gives more realistic prognosis of health effects
- ➡ **Foreign products:** some woods and wood products of unknown origin show considerable emissions, even such, which should not occur
- ➡ **European origin products:** vast majority of European wood and wood products are harmless in usual construction scenarios, borderline situations can only occur with very unfavourable or unrealistic surface-volume ratios, very bad ventilation etc.
- ➡ **Finally:** Wood and wood products can also have very advantageous effects on health, but much more research has to be focused on this topic.



Beware of the Oranges !!!

THANK YOU FOR YOUR ATTENTION

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MAS - TOXICOLOGY, EUROPEAN REGISTERED TOXICOLOGIST

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