

Scented toys – Analysing allergenic Substances

Relatively new on the market are scented toys. Not only do these substances smell good, but they also possess a more or less allergenic potential.

New Directives

In December 2009, a new EU directive **Toy Safety Directive 2009/48/EC** in regards to the regulation of chemical safety of toys was passed. The contained critical values are by all means questionable. The new Toys Directive does contain a list of 55 banned allergenic substances. However, in reality this ban on use is partially revoked through the introduction of a limit value of 0.01 percent (100 ppm = 100 mg/kg) for admissible trace levels.

The Task

Derived from this difficulty the task was drafted, to comminute a sample of a “scented toy horse” in such a manner so that a powder evolves. The scents cannot be lost though. Scents are relatively slightly elusive in order to be smelled. Therefore it has to be assumed that with the amplification of the surface, a faster transition into the ambient air occurs. Hence the substances would elude analysis. In order to avoid this to the greatest possible extend, the sample was comminuted during permanent cooling with liquid nitrogen.



Fig. 1: Original sample

Sample preparation

For this 8 x 8 mm large chunks were cut from the toys and comminuted with the **Vibratory Micro Mill PULVERISETTE 0**, equipped with a cryo box, tempered steel mortar and ball. Mortar and ball were pre-cooled in the cryo box with liquid nitrogen.

Then the sample was added and again cooled with liquid nitrogen. The in this manner prepared cryo-box was attached on top of the Vibratory-Micro Mill PULVERISETTE 0 and oscillations were started.



Fig. 2: Vibratory Micro Mill cryo box

Result

After 4 minutes, with an amplitude of 2 mm, the sample was in regards to the demands fine enough. The powder was extracted with a mixture of MTBE- hexane. A significantly higher value of the sought after substance could be in comparison to the coarsely comminuted sample detected.

As especially advantageous during the comminution proved to be, that the task could be monitored visually and the further individual addition of liquid nitrogen during the comminution is possible. In this manner the material can be kept constantly swimming in the liquid nitrogen.



Fig. 3: Ground sample

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