

Test-methods on the test-bench: A comparison of complete exhaust and exhaust particle extracts for genotoxicity/mutagenicity assessment

Sandro Steiner, Norbert V. Heeb, Jan Czerwinski, Pierre Comte, Andreas Mayer, Alke Petri-Fink and Barbara Rothen-Rutishauser

Supporting Information

Table of contents

| | | |
|----------|---|----|
| Table S1 | Relevant numbers for the calculation of exposure-hour equivalents | S2 |
| Table S2 | Applied doses of organic extract | S2 |

Supporting Information Table S1: Relevant numbers for the calculation of exposure-hour equivalents

Particle mass used for production of organic extract

| | | |
|--|------|---------------------|
| Exhaust volume (undiluted) passing the CVS (20 minutes sampling) | 152 | l |
| Collected particle mass on PallFlex filter | 2258 | µg |
| Calculated particle mass concentration (in undiluted exhaust) | 14.9 | µg l ⁻¹ |
| Mass equivalents in organic extracts (in 4ml DMSO) | 0.57 | µg µl ⁻¹ |

Particle mass deposition during exhaust exposure

| | | |
|--|-------------------------|-------------------------------------|
| Exhaust volume (undiluted) passing the exposure chambers | 12 | l h ⁻¹ |
| Particle number concentration | 4.75 x 10 ¹¹ | particles l ⁻¹ |
| Particle deposition in the exposure chamber | 1.0 x 10 ⁷ | h ⁻¹ cm ⁻² |
| Total inner surface area of exposure chambers | 2900 | cm ² |
| Particle deposition ratio in the exposure chamber | 0.005 | |
| Calculated mass of deposited particles in the exposure chamber | 3.1 x 10 ⁻⁴ | µg h ⁻¹ cm ⁻² |

Calculation of exposure-hour-equivalents (organic extract)

| | Bacteria | Lung cells |
|--|------------------------|---|
| Culture surface | 2 | 4.2 cm ² |
| Surface fraction (culture/total inner surface of exposure chamber) | 6.9 x 10 ⁻⁴ | 1.45 x 10 ⁻³ |
| Calculated particle mass deposited on cultures | 6.2 x 10 ⁻⁴ | 1.3 x 10 ⁻³ µg h ⁻¹ |
| Exposure hour equivalent of organic extract (in DMSO) | 1.1 x 10 ⁻³ | 2.3 x 10 ⁻³ µl |

Supporting Information Table S2: Applied doses of organic extract, expressed in exposure-hour-equivalents, equivalent particle mass and equivalent exhaust volume. Equivalent particle masses correspond to the mass of particles that deposits on 1 cm² during 1 hour of exposure to ten-fold diluted exhaust. Equivalent exhaust volumes correspond to the theoretical volume of exhaust that interacts with 1 cm² during one hour exposure to ten-fold diluted exhaust.

| Exposure- hour- equivalents | Volumes of organic extract (μl) | | Equivalent particle mass (μg cm ⁻²) | Equivalent exhaust volume (l cm ⁻²) |
|-----------------------------------|------------------------------------|------------------------|---|--|
| | Bacteria | Lung cells | | |
| 0 | 0 | 0 | 0 | 0 |
| 2 | 2.2 x 10 ⁻³ | 5 x 10 ⁻³ | 6 x 10 ⁻⁴ | 4.2 x 10 ⁻⁵ |
| 4 | 4.4 x 10 ⁻³ | not tested | 13 x 10 ⁻⁴ | 8.4 x 10 ⁻⁵ |
| 6 | 6.7 x 10 ⁻³ | 1.4 x 10 ⁻³ | 19 x 10 ⁻⁴ | 1.3 x 10 ⁻⁴ |
| 400 | 0.4 | not tested | 0.13 | 8.4 x 10 ⁻³ |
| 1200 | 1.3 | 2.8 | 0.38 | 2.5 x 10 ⁻² |
| 2400 | 2.7 | not tested | 0.75 | 5.1 x 10 ⁻² |
| 4800 | 5.3 | not tested | 1.5 | 0.10 |
| 14400 | 16 | not tested | 4.5 | 0.30 |
| 24000 | 27 | not tested | 7.5 | 0.51 |