Guidance sheet for:
N, N’ - Dimethylacetamide
Monitored by analysis of N-methylacetamide (NMA) in urine

BMGV: 100mmol N-methylacetamide/mol creatinine

Hazardous Substance
N, N’ - Dimethylacetamide
CAS number: 127-19-5

Workplace Exposure Limits:
8-hour TWA: 10ppm, 36mg/m³
15-minute STEL: 20ppm, 72mg/m³
Skin notation
Biological Monitoring Guidance Value (BMGV)

Guidance value: 100mmol N-methylacetamide/mol creatinine
Conversion: 1mmol/mol = 0.646mg/g

Other Guidance Values

The ACGIH BEI is 30mg/g (approx. 45mmol/mol creatinine) and the DFG BAT is 30mg/g (approx. 45mmol/mol creatinine).

Sample Collection

Urine samples should be collected at the end of shift (and if exposures are repeated – towards the end of the working week) into polystyrene universal containers (30mL).

Sample Transport to Laboratory

Send samples to the laboratory by first class post (or equivalent) to arrive within 48 hours of collection. If any delay is anticipated, store at -20°C. Packaging must comply with Post Office regulations.

Description of Suggested Method

Methanol is added to the urine sample to cause urinary proteins to precipitate. The sample is then centrifuged and 2µL of the supernatant is injected into a gas chromatograph at injection temperature of 300°C. N-methylacetamide and N-ethylacetamide (used as the internal standard) are separated on a HP Innowax column (30m × 0.32mm, 0.5µm film), with oven temperature rising at 15°C/min, from 100°C to 250°C over a period of 10 minutes. Detection is by mass spectrometry in electron impact mode, monitoring ions m/z 73 (NMA) and 87 (NEA).

Analytical Evaluation

Detection limit: 15µmol/L (3 x background)
Calibration range: Typically 0-1000 µmol/L
Precision:
- within day <6% RSD at 430µmol/L
- day to day <10% RSD at 430µmol/L
Sample stability:
5 days at ambient temperature, >3 months at 20°C
Analytical Interferences: None known

http://www.hsl.gov.uk/online-ordering/analytical-services-and-assays/biological-monitoring
Biological Monitoring
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Interpretation
Urinary N-methylacetamide results reflect systematic exposure to N,N'-dimethylacetamide that may have entered the body by inhalation or through the skin. If biological monitoring results are greater than the guidance value, it does not necessarily mean that ill health will occur, but it does mean that exposure is not being adequately controlled. Under these circumstances employers will need to look at current work practices to see how they can be improved to reduce exposure.

Other Information

Elimination half-time: For N-methylacetamide in urine, approximately 24 hours.
Confounding factors: None known
Unexposed level: None detected
Creatinine correction is advised

Alternative Methods


Quality Assurance

Internal QC:
Must be established

External QA:
Available from Health and Safety Laboratory

http://www.hsl.gov.uk/online-ordering/analytical-services-and-assays/biological-monitoring
Biological Monitoring Guidance Values

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Links

EH40 List of Approved Workplace Exposure Limits
http://www.hse.gov.uk/pubns/books/eh40.htm

Biological Monitoring at HSL
http://www.hsl.gov.uk/online-ordering/analytical-services-and-assays/biological-monitoring

References

Dyne D. Biological Monitoring Method for N,N’-Dimethylacetamide. HSL Report OT/96/03 (available from HSL).

For further advice, please contact us:

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http://www.hsl.gov.uk/online-ordering/analytical-services-and-assays/biological-monitoring