

Methylmalonic acid (MMA) is a sensitive biomarker for the diagnosis of a functional vitamin B12 deficiency. The determination of MMA is usually made from serum, in case of patients with renal insufficiency the analysis is performed from urine. Plasma samples may be alternatively used to serum, depending on sample availability. For routine analysis, the ClinMass® Complete Kit allows for a reliable and quick MMA analysis within a 4 min injection interval. A simple matrix precipitation is required for sample preparation. For the optimisation of the tandem mass spectrometer and for the test run of the analytical system, a ClinMass® Optimisation Mix is provided. Calibration and quality control is performed in a convenient and cost-efficient way, using a ClinCal® 4-Level Serum Calibrator Set and ClinChek® Serum Controls for all three sample matrices.

## Vitamin Status

# Methylmalonic Acid in Serum / Plasma / Urine

### Test Data

Linearity (up to):	Serum, Plasma: 3388 nmol/l
	Urine: 71148 nmol/l
Lower detection limit:	Serum, Plasma: 9.30 nmol/l
	Urine: 95.3 nmol/l
Lower determination limit:	Serum, Plasma: 33.9 nmol/l
	Urine: 711 nmol/l
Intraassay precision:	2.9 %
Interassay precision:	3.1 %

### LC-MS/MS Parameters

#### LC-Parameters

Gradient pump:	Mobile Phase A / B (0.1 - 1.4 ml/min)
Injection volume:	10 µl
Injection interval:	4 min
Column heater:	30 °C

#### MS-Parameters

Ion-Source:	ESI negative
MS/MS-Mode:	MRM

### Sample Preparation

#### Precipitation / Addition of IS:

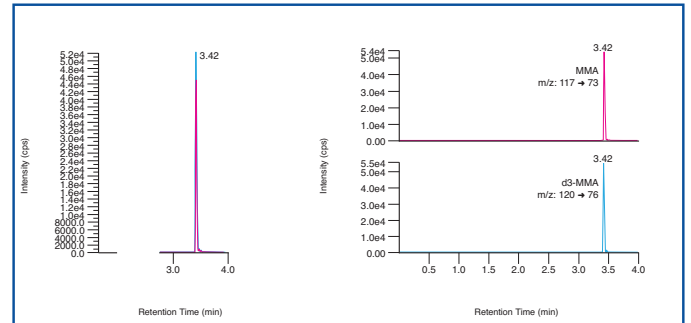
400 µl P Precipitant (contains internal standard)	100 µl sample* (calibrator, control, patient)
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LC-MS/MS Analysis: ↓ mix and centrifuge

Inject 10 µl of the supernatant
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\*Urines are diluted (50 µl urine + 1000 µl Diluting Solution D)

Chromatogram (left) and mass traces (right) of the ClinCal® Serum Calibrator, Level 2 (order no. MS5013)



### Ordering Information

Order No.	Description	Quantity
MS5000	ClinMass® Complete Kit for Methylmalonic Acid in Serum / Plasma / Urine for 300 assays	1 pce.
<b>Kit Components (order no. MS5000):</b>		
MS5005	Autosampler Washing Solution	1000 ml
MS5008	Mobile Phase A	1000 ml
MS5009	Mobile Phase B	1000 ml
MS5012	P Precipitant with Internal Standard	3 x MS5012 (3 x 40 ml)
MS5013	Serum Calibrator Set, lyophil., Level 0 - 3	4 x 1 x 2 ml
MS5020	Sample Preparation Vials	3 x MS5020 (3 x 100 pcs.)
	Manual	1 pce.
<b>Additional Components</b>		
MS5014	Optimisation Mix	2 ml
MS5021	D Diluting Solution for Urine	50 ml
<b>Start Accessories:</b>		
MS5030	Analytical Column with test chromatogram	1 pce.
MS5032	Guard Column Holder incl. 1 Guard Column	1 pce.
MS5033	Guard Column	5 pcs.
<b>ClinChek® Controls:</b>		
MS5080	Serum Control, lyophil., Level I	10 x 2 ml
MS5081	Serum Control, lyophil., Level II	10 x 2 ml
MS5082	Serum Control, lyophil., Level I, II	2 x 5 x 2 ml

→ Quick sample preparation (matrix precipitation)

→ Optimal separation of MMA from succinic acid

→ 4-Level Calibrator Set included