

## Trace Elements

Trace Elements and their role in cell culture have become of greater interest due to the need to reduce the use of sera.

In their work, McKeehan et al. (MCDB 104)<sup>1</sup> and Hamilton et al. (MCDB 301)<sup>2</sup> identified several trace elements important in serum free applications. In addition, experiments by Cleveland et al.<sup>3</sup> indicate that the use of trace elements may even reduce or eliminate the need for growth factors in serum free media.

Mediatech's three Trace Elements Solutions incorporate these metals in formulations designed for use individually or in combination. The use of each solution will vary based on the type of cells in culture, as well as the growth medium and supplementation.

Trace Elements A may be applicable to cells known to have a positive response to the presence of selenium, provided the presence of copper, zinc, or iron would be tolerated or beneficial. Selenium is thought to help detoxify free radicals as a cofactor for GSH synthetase, while iron, copper, and zinc may be bound by serum protein. The formulation also substitutes ferric citrate for ferrous sulfate to provide for greater stability in solution.

Trace Elements B Solution has the same composition as Cleveland's Trace Element I. The combination of Trace Elements A and B contains the trace elements of MCDB 104. Mediatech's Trace Elements C Solution has the same composition of Cleveland's Trace Elements II, and the combination of Mediatech's Trace Elements A, B, and C contains the trace elements of MCDB 301.

**Trace Elements A**

Catalog No.	99-182
	1000x Liquid
Components	mg/L
CuSO <sub>4</sub> · 5H <sub>2</sub> O	1.60
ZnSO <sub>4</sub> · 7H <sub>2</sub> O	863.00
Selenite · 2Na	17.30
Ferric citrate	1155.10
Formula Weight	2.04 g/L
Specifications	
pH (after buffer)	6.0 - 6.5
Osmolality (mOsm)	INFO

**Trace Elements B**

Catalog No.	99-175
	1000x Liquid
Components	mg/L
MnSO <sub>4</sub> · H <sub>2</sub> O	0.17
Na <sub>2</sub> SiO <sub>3</sub> · 9H <sub>2</sub> O	140.00
Molybdic acid, Ammonium salt	1.24
NH <sub>4</sub> VO <sub>3</sub>	0.65
NiSO <sub>4</sub> · 6H <sub>2</sub> O	0.13
SnCl <sub>2</sub> (anhydrous)	0.12
Formula Weight	0.14 g/L
Specifications	
pH (after buffer)	INFO
Osmolality (mOsm)	INFO

**Trace Elements C**

Catalog No.	99-176
	1000x Liquid
Components	mg/L
AlCl <sub>3</sub> · 6H <sub>2</sub> O	1.20
AgNO <sub>3</sub>	0.17
Ba(C <sub>2</sub> H <sub>3</sub> O <sub>2</sub> ) <sub>2</sub>	2.55
KBr	0.12
CdCl <sub>2</sub>	2.28
CoCl <sub>2</sub> · 6H <sub>2</sub> O	2.38
CrCl <sub>3</sub> (anhydrous)	0.32
NaF	4.20
GeO <sub>2</sub>	0.53
KI	0.17
RbCl	1.21
ZrOCl <sub>2</sub> · 8H <sub>2</sub> O	3.22
Formula Weight	0.002 g/L
Specifications	
pH (after buffer)	INFO
Osmolality (mOsm)	INFO

Product Description	Catalog No.	Size
Trace Elements A 1000X Solution	99-182-Cl	1 x 100 mL
Trace Elements B 1000X Solution	99-175-Cl	1 x 100 mL
Trace Elements C 1000X Solution	99-176-Cl	1 x 100 mL

**References:**

<sup>1</sup>McKeehan WL, McKeehan SL, Hammond, Ham RG. 1997, In Vitro. 13:399

<sup>2</sup>Hamilton WG, Ham RG. 1977. In Vitro. 13:537.

<sup>3</sup>Cleveland WL, Wood I, Erlanger BF. 1983. J Imm Methods. 56:211-234