Silantes Concentrate Medium

Silantes Concentrate Medium for E.coli and yeasts is a 10-fold concentrated medium obtained from the hydrolysates of stable isotope labeled bacteria fermentations (*Cupriavidus nekator*). This hydrolysate is a perfect nutrient source for bacteria and yeasts.

The Concentrates are available as solution in standard pack sizes or in bulk sizes and can be provided in all ^{2}H, ^{13}C and ^{15}N combinations.

Maximum Flexibility

The Silantes Concentrate consists of pure concentrated bacterial hydrolysate. No adjustments have been made to the salt concentrations or other ingredients, as optimization of the ingredients must be made according to the experimental requirements. With the Silantes Concentrate medium, you have maximum flexibility and can dilute and optimize the medium according to your needs.

A manual is included with every delivery, providing you with the recommended amounts of ingredients validated by Silantes for different dilution steps.

Which concentration is best for my experiment?

- OD_{600}1 (~ 10-fold dilution): The cell density yields are comparable to 0,2% glucose-M9 media.
- OD_{600} 2 (~ 5-fold dilution) is commonly used if inducing the cells at OD_{600} 0.6-0.9 followed by a ~4h incubation. The cell density yields are comparable to 0,4% glucose-M9 media.
  This product is also available as a ready-to-use solution.
- OD_{600} 4 to 5 (~ 2-2.5-fold dilution) is commonly used if growing the cells in a fermenter and/or if growing the cells to higher ODs. The yield cell densities are comparable to LB-media.

Consistent high quality

The 10-fold concentration refers to the performance and implies: When cultivating cells in the undiluted concentrate medium, the cell density reaches a theoretical optical density of OD_{600} = 10 after 24 hours. The concentrate is standardized - qualitative fluctuations from one batch to the next are prevented.

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Medium composition

The medium is based on the bacterial hydrolysate of *Cupriavidus necator*. Below are the literature values for a number of components.

Component	Composition (g/g DCW) *	Source
Protein	0.680	Srinivasan et al. (2002)
Phospholipid	0.050	Gmeiner et al. (1980)
Cofactors and vitamins	0.030**	Ingraham et al., 1983
Cell wall	0.150	
Cell wall (Lipopolysaccharide)	0.034	Neidhardt et al. (1996)
Cell wall (Carbohydrate)	0.055	Determined in own study
Cell wall (Peptidoglycan)	0.060 ***	Determined in own study

* DCW = Dry Cell Weight. The values are calculated for an average macromolecular composition of *Cupriavidus necator* H16 in MR minimal medium with D-fructose. The biomass composition was experimentally measured during the exponential growth phase of aerobic batch cultivation (specific growth rate: 0.2 h-1 average of three samples). The molecular weight of one water molecule was subtracted from the molecular weight of each molecule to account for esterification or peptide bonding.
** The assumption is based on the fact that small molecules make up less than 3 % of the dry cell weight.
*** In this study, carbohydrates made up about 5.5 % of the cell wall. The rest was assumed to be peptidoglycan.

The amino acid composition determined for OD2 medium:

Amino Acid	AA [µmol / l OD2]	%
As	131.8	21.5
Thr	17.5	2.9
Ser	24.9	4.1
Glu	75.7	12.4
Gly	68.0	11.1
Ala	77.7	12.7
Val	19.2	3.1
Met	9.1	1.5
Ileu	15.5	2.5
Leu	32.9	5.4
Tyr	10.5	1.7
Phe	17.7	2.9
His	58.2	9.5
Lys	21.0	3.4
Arg	14.4	2.4
Pro	17.5	2.9
	611.7	100

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