INSTRUCTIONS

Single-Use MALDI Matrices

90031 90032 90033 90035

2098.0

Number	Description
90031	**Alpha-Cyano-4-Hydroxycinnamic Acid (CHCA), Single-Use,** 24 × 1 mg microtubes (green)
90032	**Sinapinic Acid (SA), Single-Use,** 24 × 1 mg microtubes (purple)
90033	**2,5-Dihydroxybenzoic Acid (DHB), Single-Use,** 24 × 4 mg microtubes (blue)
90035	**CHCA, SA and DHB Sample Pack, Single-Use,** 8 × 1 mg microtubes (green) of CHCA, 8 × 1 mg microtubes (purple) of SA and 8 × 4 mg microtubes (blue) of DHB

Storage: Upon receipt store product at 4°C. Product shipped at ambient temperature.

Introduction

Thermo Scientific MALDI Matrices are highly purified, recrystallized reagents packaged in convenient single-use tubes sufficient for analyzing up to 96 samples. Matrix assisted laser desorption ionization (MALDI) matrices produce the cleanest mass spectrometric (MS) spectra when they are recrystallized and prepared daily, which is inconvenient and typically results in significant waste. The unique packaging of purified, recrystallized alpha-cyano-4-hydroxy-cinnamic acid (CHCA), sinapinic acid (SA) and 2,5-dihydroxybenzoic acid (DHB) MALDI matrices (Table 1) makes it easy to prepare high-quality MALDI reagents in minutes.

MALDI and electrospray ionization (ESI) are the most common methods to ionize peptides for MS analysis. MALDI is widely used because it is significantly faster than ESI and the ionized molecules are almost exclusively singly charged, making interpretation easier. Also, MALDI is readily automated and highly sensitive. This powerful method for MS peptide analysis is now easier to perform with our single-use, highly pure MALDI matrices that are exceptionally convenient to use.

Table 1. Properties and uses of CHCA, DHB and SA MALDI matrices.

Compound	Synonyms	MW (g/mol)	Wavelength (nm)	Working Conc. (mg/ml)	Applications
α-cyano-4-hydroxycinnamic acid	CHCA	188.16	337, 355	5-40	Peptides, lipids, nucleotides
2,5-dihydroxy benzoic acid	DHB, gentisic acid	154.12	337, 355, 266	40-100	Small molecules, small peptides, nucleotides, oligonucleotides, oligosaccharides
3,5-dimethoxy-4-hydroxycinnamic acid	SA, sinapic acid, sinapinic acid	224.21	337, 355, 266	5-40	Large peptides, whole proteins, lipids

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MALDI Procedure

1. Dissolve one tube of MALDI matrix with 100 µl of 70/30 acetonitrile/water with 0.1% TFA, which results in 10 mg/ml of CHCA or SA or 40 mg/ml of DHB.
2. Apply 0.5 µl of a protein digest (0.1-1 pmol/µl) onto a MALDI target plate and immediately add 0.5 µl of the MALDI matrix solution. Alternatively, mix the protein digest with the matrix solution and then apply to the MALDI target plate.
3. Dry sample at 22°C or 37°C.
4. Analyze sample by MALDI-MS.

Troubleshooting

Problem	Possible Cause	Solution
No signal	Insufficient sample	Spot larger amount or a more concentrated sample
	Sample contained contaminating salts or detergents	Spot less sample to minimize contaminants
		Clean sample with reversed-phase ZipTip® Pipette Tip
		Wash crystallized sample/MALDI matrix with 1-2 µl cold distilled water, remove water, add a small amount of matrix and let dry
	Poor matrix crystallization	See contaminating salts or detergents (above)
	The MALDI matrix used was not optimal for the application	Matrix choice depends on instrument, instrument settings and sample type; try individual reagents in the sample pack
	Insufficient matrix	Dissolve MALDI matrix in less volume to produce a higher concentration of the matrix stock
	Matrix did not efficiently ionize peptides of interest	Use a different matrix such as CHCA or DHB for small peptides, or SA for proteins and peptides > 4,000 Da
Poor crystal formation, shiny or gel-like material	Sample contained contaminating salts or detergents	See contaminating salts or detergents (above)
	Matrix solution was prepared too far in advance of analysis	Prepare matrix daily or weekly at a minimum
	Poor co-crystallization	Premix sample and matrix then spot onto the target
High background signal	The MALDI matrix used was not optimal for the application	For optimal signal-to-noise ratios, use DHB for small molecules and SA for intact proteins and large peptides
		Measure spectra above 500 m/z
Cannot detect phosphopeptides	Poor phosphopeptide ionization	To enhance phosphopeptide ionization, substitute phosphoric acid for TFA in 50/50 acetonitrile/water MALDI matrix solution and apply 0.5 µl of 25 mM ammonium citrate on spot

Related Thermo Scientific Products

20291 **No-Weigh™ DTT,** 48 × 7.7 mg microtubes

20290 **DTT,** 5 g

20490 **TCEP•HCl [Tris(2-carboxyethyl) phosphine hydrochloride],** 1 g

28904 **Trifluoroacetic Acid (TFA),** 10 × 1 ml

51101 **Acetonitrile, HPLC grade,** 1 L

77720 **Bond-Breaker® TCEP Solution, Neutral pH,** 5 ml

89853 **Phosphopeptide Isolation Kit**

89871 **In-Gel Tryptic Digestion Kit**

89895 **In-Solution Tryptic Digestion and Guanidination Kit**

90051	**Lys-C Endoproteinase, MS Grade,** 20 µg
90053	**Asp-N Endoproteinase, MS Grade,** 2 µg
90054	**Glu-C Endoproteinase, MS Grade,** 5 × 10 µg
90055	**Trypsin Endoproteinase, modified, TPCK treated, MS Grade,** 5 × 20 µg
90056	**Chymotrypsin Endoproteinase, TLCK treated, MS Grade,** 4 × 25 µg

General References

1. Siuzdak, G. (2006). The Expanding Role of Mass Spectrometry in Biotechnology, 2nd Ed., pp 99-107. MCC Press, San Diego, CA.
2. Zhou, W., *et al.* (2000). Detection and sequencing of phosphopeptides affinity bound to immobilized metal ion beads by matrix-assisted laser desorption/ionization mass spectrometry. *J Am Soc Mass Spectrom* **11:**273-82.
3. Kjellstrom, S. and Jensen, O.N. (2004). Phosphoric acid as a matrix additive for MALDI MS analysis of phosphopeptides and phosphoproteins. *Anal Chem* **76:**5109-17.