Chemical Variants of Vitamin B_{12} in Photosynthetic Microbes

ACE®
Ultra-inert
UHPLC & HPLC Columns

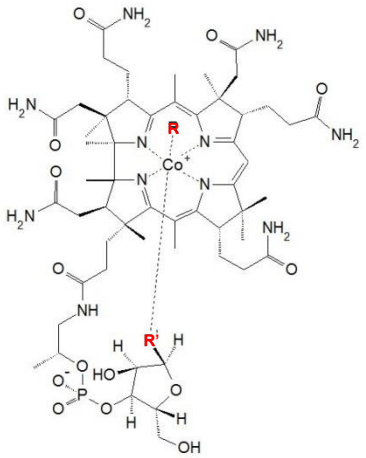
Application #**AN4620**

Conditions

Column:	ACE 5 AQ
Dimensions:	150 x 2.1 mm
Part Number:	ACE-126-1502
Mobile Phase:	A: 0.1% formic acid in H_2O B: MeOH

Time (mins)	%B
0	5
25	70
30	5

Flow Rate:	0.2 mL/min
Temperature:	30 °C
Detection:	Bruker micrOTOF-QII MS ESI in positive ion mode



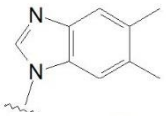
Prokaryotic cyanobacteria and eukaryotic algae use different chemical variants of vitamin B_{12}. Cyanobacteria synthesise pseudocobalamin. Microalgae synthesise cobalamin.

Upper-axial ligands (R)

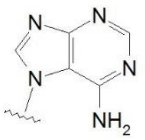
	with DMB	with Adenine
R=CN	cyanocobalamin (vitamin B_{12})	cyanopseudocobalamin (pseudovitamin B_{12})
R=Ado	adenosylcobalamin (coenzyme B_{12})	adenosylpseudocobalamin (pseudocoenzyme B_{12})
R=CH_3	methylcobalamin	methylpseudocobalamin
R=OH	hydroxycobalamin	hydroxypseudocobalamin

Lower-axial ligands (R')

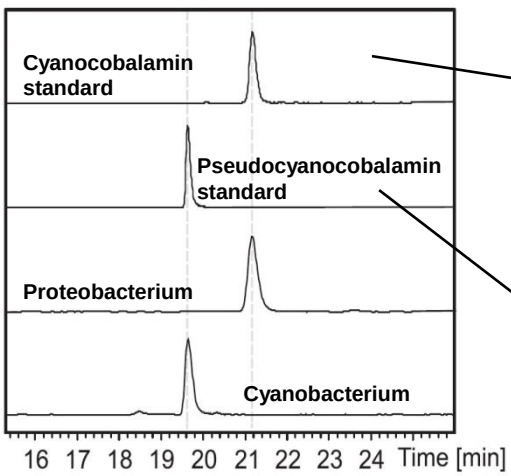
DMB

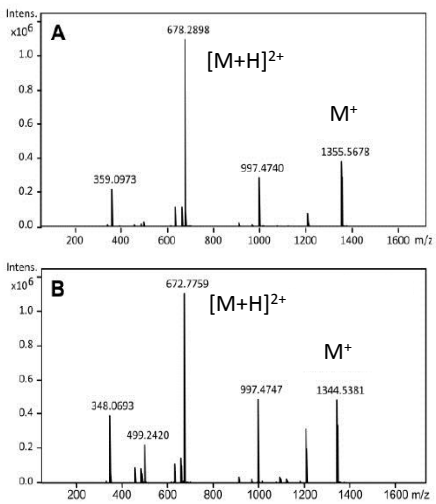


Adenine



Extracted ion chromatograms for *m/z* 1355.5 (cyanocobalamin) and *m/z* 1344.5 (cyanopseudocobalamin)





Helliwell KE, Lawrence AD, Holzer A, Kudahl UJ, Sasso S, Krautler B, Scanlan DJ, Warren MJ, Smith AG (2016) Cyanobacteria and eukaryotic algae use different chemical variants of vitamin B12. Current Biology 26, 999-1008. doi:10/1016/j.cub.2016.02.041