

This note describes a determination method for water-soluble vitamins using an electrochemical detector (ECD).

Analysis of water-soluble vitamins are generally performed using UV detection coupled with reversed-phase HPLC.

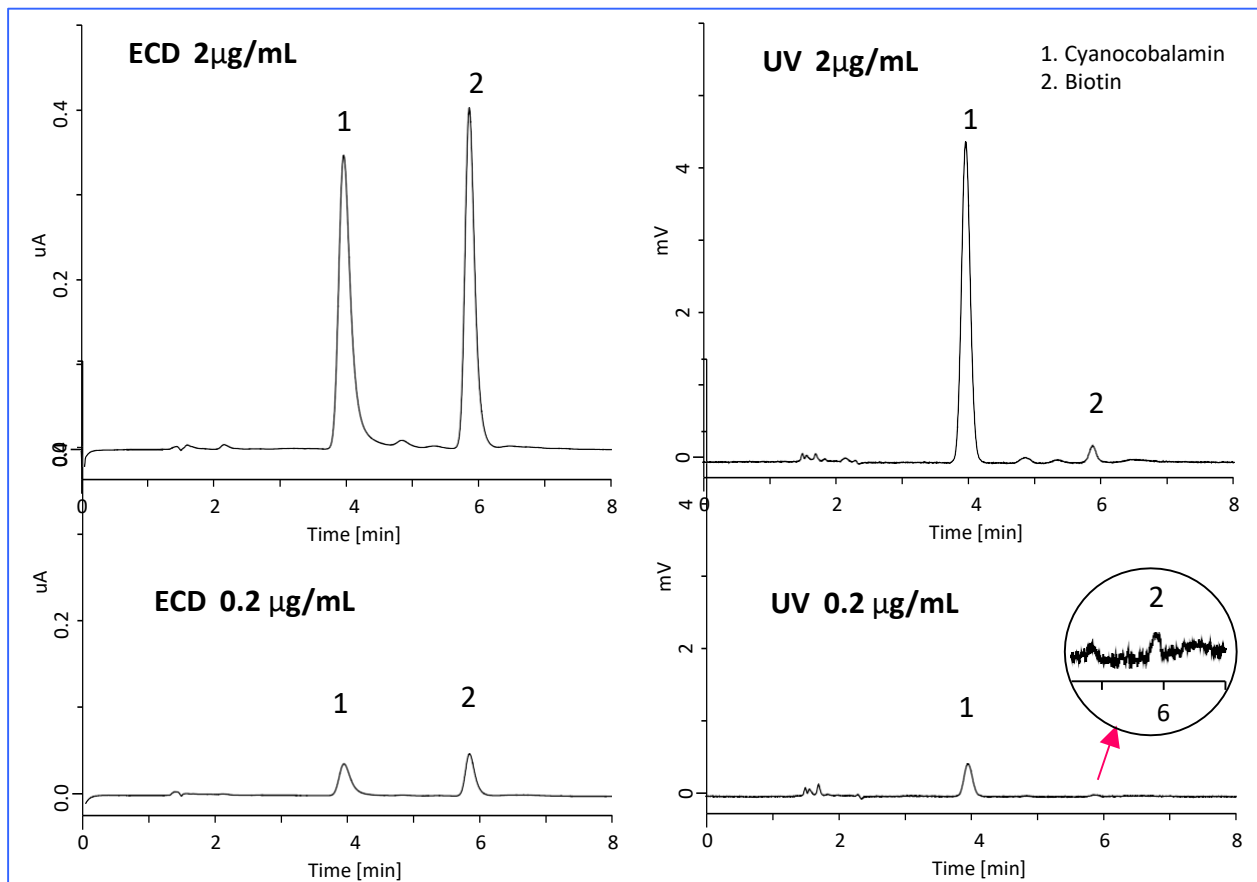
However, sensitive determination of some vitamins [e.g. biotin (Vitamin B₇)] with HPLC-UV system is difficult, because their response to UV detector is very weak. In such case, ECD is a powerful alternative to UV detector. Biotin can be detected

with high sensitivity as well as cyanocobalamin because both are electrochemically reactive species.

ED703 pulse is an ECD equipped with boron-doped diamond electrode. The diamond working electrode offers stable response, low background current and wide potential window. ED703 pulse is very useful to quantify various compounds.

(T.Tamura)

Comparison of the sensitivity: ECD vs. UV detector



Conditions

Column : Inertsil ODS-SP
(5µm, 150 x 4.6 mm I.D.)
Cat.No. 5020-02745

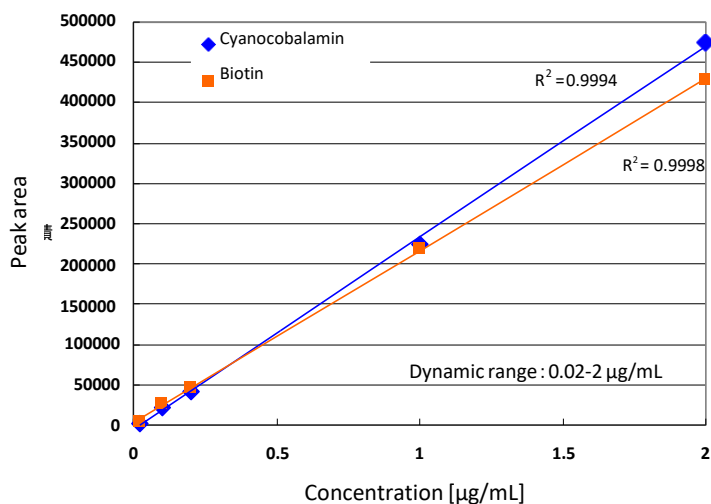
Eluent : A) CH₃CN
B) H₂O(0.1 % H₃PO₄)
A/B = 18/82, v/v
(gradient mixer)

Flow rate : 1.0 mL/min

Col. Temp. : 40 °C

Detection : ECD 1600 mV vs. Ag/AgCl
(Boron-doped diamond electrode) UV 220 nm

Inj. Vol. : 10 µL



An analysis of water-soluble vitamins with gradient elution**Conditions**

Column : Inertsil ODS-3
(5 μm , 150 x 4.6 mm I.D.)
Cat.No. 5020-01731

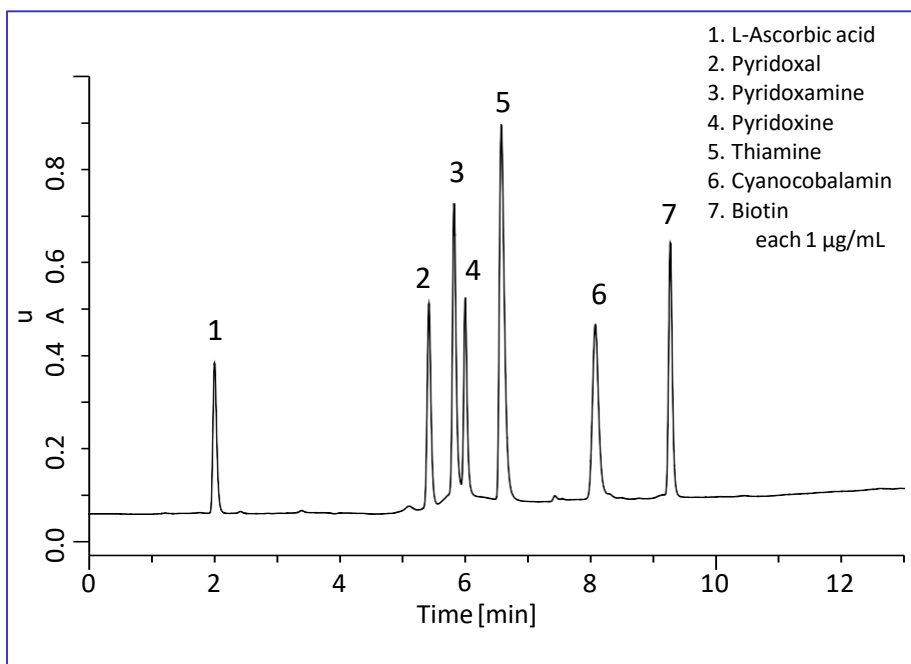
Eluent : A) CH_3CN (0.1 % H_3PO_4)
+ 5 mM IPCC-05* B) H_2O (0.1%
 H_3PO_4)
+ 5 mM IPCC-05
A/B = 5/95 – (12 min) – 40/60
* IPCC-05: $\text{C}_5\text{H}_{11}\text{SO}_3\text{Na}$

Flow rate : 1.0 mL/min

Column Temperature
: 40 $^\circ\text{C}$

Detection : ECD 1600 mV vs.
Ag/AgCl (Boron-doped
diamond electrode)

Inj. Vol. : 10 μL



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