ToxinStar™ Photo Chemical Reactor

Product Introduction

ToxinStar™ photochemical post-column derivatization reactor is widely used in liquid chromatography detection analysis. When inoperation, it is put in between the HPLC column and the detector, and produces post-column photochemical derivatives to enhance the sensitivity of fluorescence, UV, electrochemical and chemiluminescence detections, and the response selectivities.

An example is the detection of aflatoxin by liquid chromatography-fluorescence method. When a photochemical derivatization reactor is used to produce the post-column derivatization, the fluorescence intensity of aflatoxins B1 and G1 can be effectively enhanced, and the sensitivity can reach sub-0.5ppb level, without the need of any chemical reagent.

Besides aflatoxin detection, the ToxinStar™ unit can also be applied to the analysis of large quantities of barbiturates, amino acids, peptides, aflatoxin, vitamin and sulfonamides, etc. It can also enhance the fluorescence intensity in HPLC methods for sulfonamides, such as Sulfadiazine, Sulfapyridine, Sulfamerazine, Sulfadimidine, Sulfamethoxydiazine, Sulfaquinoxaline, with the sensitivity level reaching about 10 ppb.

Product Parameters

- P/N: 00836-00002
- Brand : Welch ToxinStar™
- Runtime environment temperature: 5℃ to 40℃
- Relative humidity ≤85%
- Maximum flow rate: 1-2 ml/min
- Sensitivity: bleow 0.5ppb
- Response enhancement: more than 5 times
- Complies with AOAC 2005.08, AOAC 2008.02, AOCS Aa 11-05, Taiwanese standard (food announcement No. 0981800370),European Pharmacopoeia 2.8.18 standard method, and Chinese Pharmacopoeia I (Aflotoxin detectionmethod).

Product Advantages

Items \ Derived types	Post-column derivatization		Pre-column derivatization
	Photochemical	Electrochemical	
No chemical reagent, safe in operation	√	×	×
Extend HPLC instrument lifetime (no corrosive liquid)	√	×	×
No wash steps	√	×	×
No derivative temperature requirements	√	×	×
Easy to eliminate the distractive influence of close retention peaks	√	×	√
High sensitivity	√	√	√

Note: Aflatoxin is the derivative of dihydrogen furan coumarin, an ingredient in some Chinese medicines. Aflatoxin' s interfering effects

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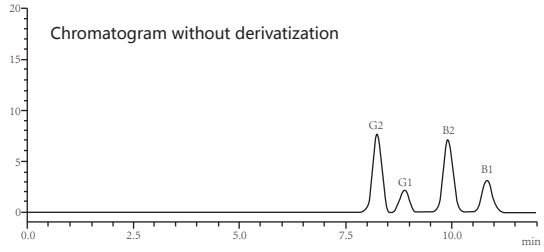
Applications

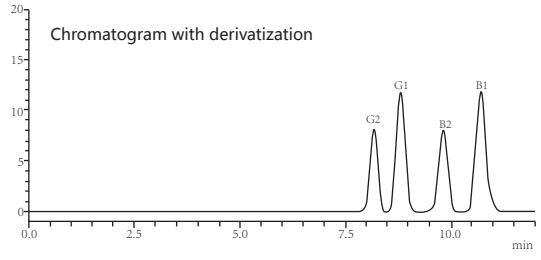
1. Detection of Aflatoxin

Aflatoxin B1 and G1 both have strong fluorescence effect. But when they are in contact with water, however, the fluorescence effect disappears due to a fluorescence quenching phenomenon, and is thus difficult to detect with an HPLC method. Here we demonstrate the method of photochemical derivatization that enhances the fluorescence of Aflatoxin B1 and G1 and therefore enables an effective HPLC analysis method.

Conditions:

Column: Welch Ultisil™ XB-C18, 5μm, 4.6×150mm
Mobile phase: methanol : water = 45 : 55
Flow rate: 0.8mL/min
Detector: excitation wavelength 360nm, emission wavelength 440nm
Injection volume: 20-100μL
Photochemical derivatization system: Photochemical derivatization reactor (installed between HPLC column and fluorescence detector)





2. Detection of Sulfonamides

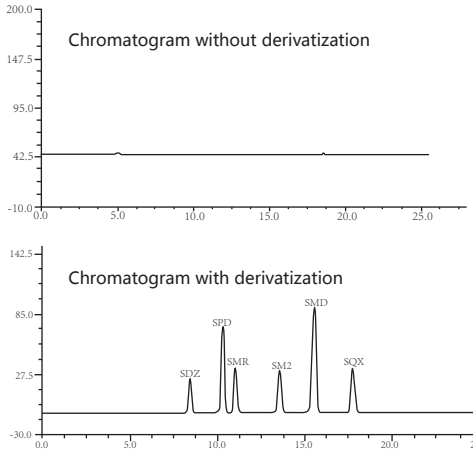
Sulfonamides, such as Sulfadiazine (SDZ), Sulfapyridine (SPD), Sulfamerazine (SMR), Sulfadimidine (SM2), Sulfamethoxydiazine (SMD) and Sulfaquinoxaline (SQX), originally have no fluorescence. After photochemical derivatization, however, these 6 kinds of sulfanilamide gain fluorescence, and thus can be detected by the HPLC fluorescence detector with a sensitivity as low as 10 ppb.

Conditions:

Column: Welch Ultisil™ XB-C18, 5μm, 4.6×250mm
Flow rate: 1.0mL/min
Detector: excitation wavelength 232nm, emission wavelength 400nm
Injection volume: 20-100μL

Gradient Program

Time (min)	Acetonitrile (%)	Water (%)
0~15	18	82
15~25	40	60
25~30	18	82



Product Installation

1. Take out all products from the box, connect the power cord to the device
2. Connect a PEEK fingertight on each end of pipelines of the reactor, without direction restriction
3. Connect one end of the pipeline to the HPLC column, don’ t connect the other end pipeline to the fluorescence detector until flushing with mobile phase for 5 mins
4. Turn on the power of UV 254nm lamp to analysis

Shipping List

Please make sure all parts and components are present with the device. The full shipping list is in the table below. Any questions, please contact us or our local supplier as soon as possible.
1. Post-column photochemical derivative reacter(including 20m reaction coil, 254nm lamp tubes, reaction tank, cooling fan, etc.)
2. Power cord
3. PEEK fingertights, 2pk, equal diameter(1/16’ ’) stainless two-way valve
4. Packing case

After-sales Warranty

Thank you again for choosing our products! We warrant our product to a high standard of quality and craftsmanship. Under normal use conditions, our warranty period is 12 months from the date of purchase that includes the full cost of repair or replacement of damaged parts.
Outside the warranty period, we only charge the part replacement cost. However, if damage is due to improper use, repair or refit without
authorization, this warranty is then voided, and the customer will bear all and any repair or replacement cost.