

Summary:

The sample is combined with hydroxylamine solution and tris(hydroxymethyl)-aminomethane (tris) buffer at pH 8, forming hydroxamic acid from the β-lactam ring of penicillin. Sulfuric acid and ferric nitrate solution are subsequently added to produce a ferric-hydroxamate complex, which is colorimetrically detected at 480 nm. The blank channel reverses the order of the tris buffer and sulfuric acid addition. The sample is combined with sulfuric acid and hydroxylamine solution at pH <3, preventing the formation of hydroxamic acid by the β-lactam. Ferric nitrate solution and tris buffer are then added, and any color that is formed is from products other than β-lactam. The blank absorbance is colorimetrically detected at 480 nm and subtracted from the sample measurement.

Interferences:

Interference from sample color is eliminated with the blank channel. Aqueous colloidal suspensions containing penicillin usually do not need to be filtered.

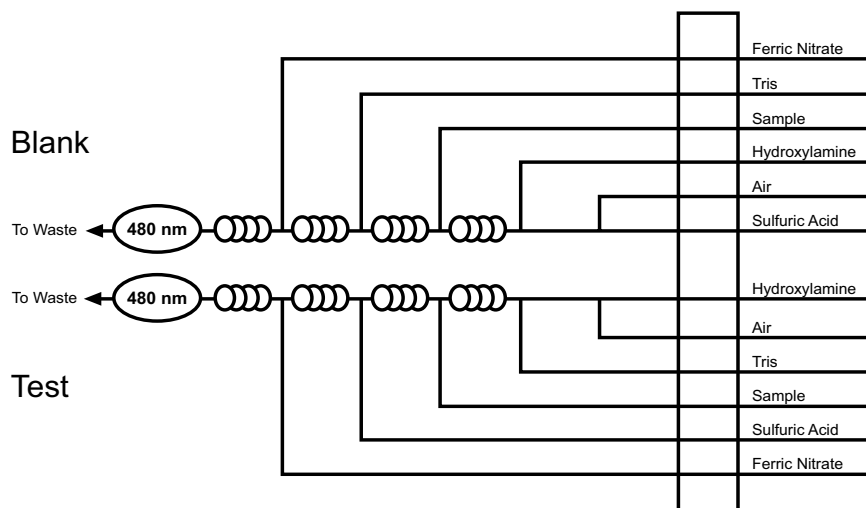
Performance Specifications:

Range:	300–6,000 units/mL
Throughput:	60 samples/hour
Precision:	
1,000 units/mL	<3% RSD
Method Detection Limit (MDL):	3 units/mL

Chemicals:

Brij®-35, 30% w/v (OI Analytical Part #A21-0110-33)	Hydroxylamine Hydrochloride, NH ₂ OH•HCl
Ferric Nitrate Nonahydrate, Fe(NO ₃) ₃ •9H ₂ O	Sulfuric Acid, concentrated, H ₂ SO ₄
	Tris(hydroxymethyl)aminomethane, (COH ₂) ₃ CNH ₂

Basic Flow Diagram:



Selected Reference:

Stevenson, C.E.; Bechtel, L.D.; Coursin, L.J. *Advances in Automated Analysis. Technicon International Congress 1969, 2, 251–256.*

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