

# Catecholamine Analysis with Star 9080 EC Detector

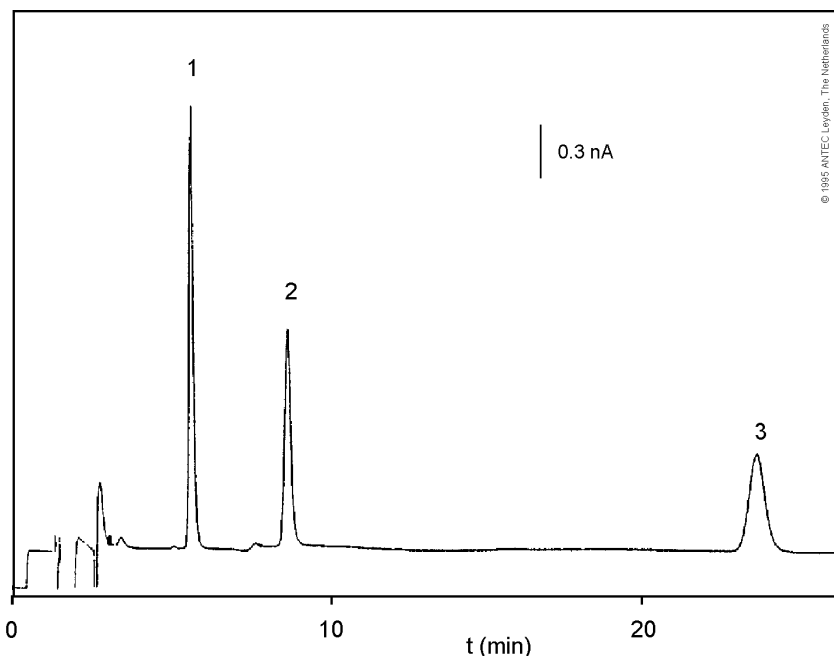
# LC

Varian Application Note  
Number 16

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**Key Words:** Star 9080, Catecholamines, Clinical, Biomedical

## Standard Separation



**Analysis of 30 nmol/L noradrenaline (1), adrenaline (2) and dopamine (3).**

**Detector** Varian Star 9080 Amperometric Electrochemical Detector

**Column** ODS, 4  $\mu$ , 150 x 4.6 mm

**Flow rate** 1.0 mL/min

**Mobile phase** H<sub>3</sub>PO<sub>4</sub> 50 mM, citric acid 50 mM, pH=3.1 with KOH, 20 mg/L EDTA, 100 mg/L octane sulphonic acid (OSA), 5% methanol

**Sample** 20  $\mu$ L injection catecholamine standards, 30 nmol/L

**Temperature** 30 °C

**Flowcell** 2.74 mm Glassy Carbon working electrode

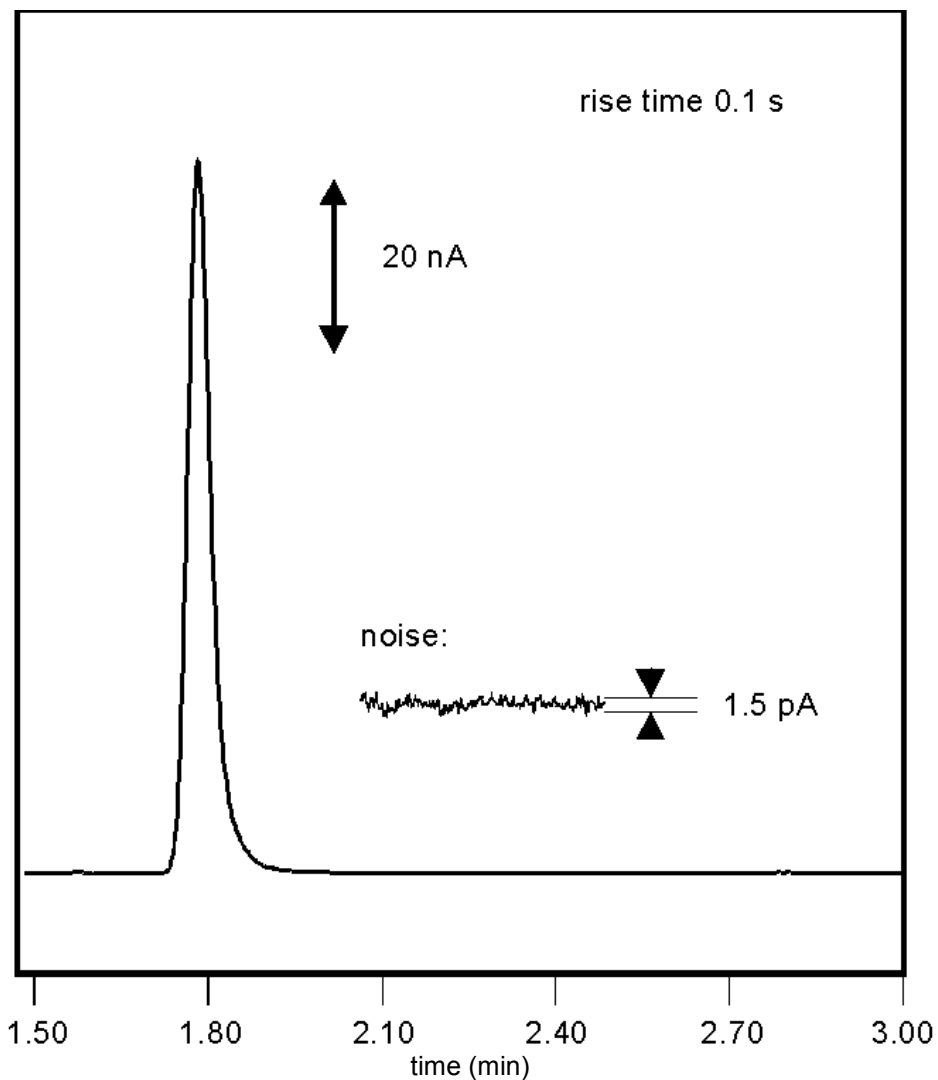
**REF** Ag/AgCl reference electrode filled with saturated KCl/AgCl

**E-cell** 800 mV (vs. Ag/AgCl)

**I-cell** 3 nA (background current)

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## Calculation of S/N Ratio and Detection Limit



*A typical S/N ratio for norepinephrine measured with a VT-03 glassy carbon flowcell is 53000.  
The amount injected is 20 pmole (1.0  $\mu\text{mol/L}$ ).  
The concentration detection limit based on three times the noise (pp) is 56 pmol/l.*

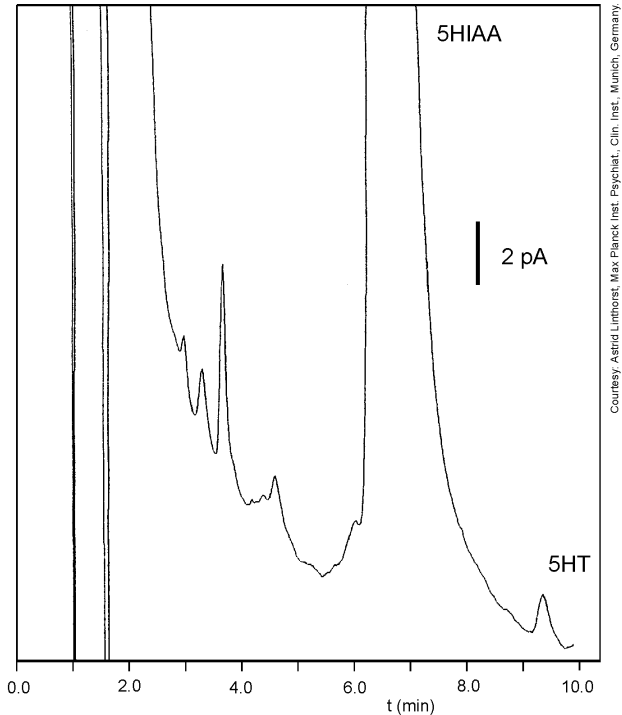
### Calculations:

$$S / N \text{ ratio} = \frac{\text{signal (nA)}}{\text{noise pp (nA)}} = 53000 \text{ (1.0 } \mu\text{mol/L, 20 } \mu\text{L)}$$

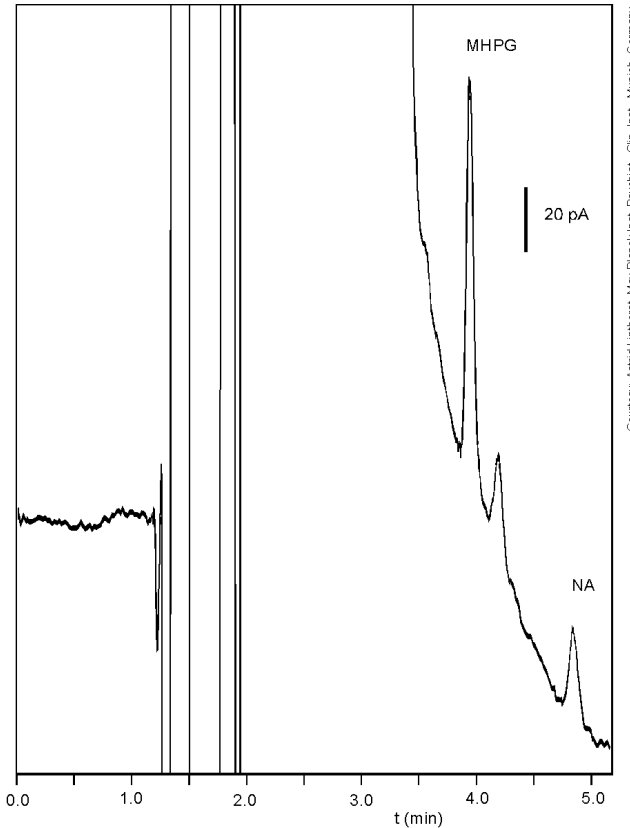
$$c_{\text{LOD}} = \frac{3 \times \text{noise pp}}{\text{signal}} \quad c_A = 56 \text{ pmol/L}$$

Minimum detectable amount:  $56 \text{ pmol/L} \times 20 \text{ } \mu\text{L} = 1.12 \text{ fmol (} 10^{-15} \text{ mol)}$

# Neurotransmitters in rat tissue



**Analysis of rat hippocampal dialysate 50  $\mu$ L injection.**  
Concentrations (amounts) are 185 nM (5.5 pmol) 5-hydroxyindole acetic acid and 154 pM (4.6 fmol) 5-hydroxytryptamine (serotonin).



**Analysis of rat preoptic area dialysate 50  $\mu$ L injection.**  
Concentrations (amounts) are 10 nM (318 fmol) MHPG and 0.36 nM (11 fmol) Noradrenaline.



*These data represent typical results.  
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