

## **Shodex HILICpak VC-50: Unique Multimodal Column for Polar Anionic Substances including Neurotransmitter Analysis**

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### **Introduction:**

Neurotransmitters are chemical messengers that transmit signals across a chemical synapse from the neuron by binding to specific receptors. Many neurotransmitters are synthesized from amino acids and only require a small number of biosynthetic steps for conversion. Neurotransmitters can range from about the size of a single amino acid to a large protein. Since they are composed primarily of amino acids, a column with diol functional groups would be ideal to analyze samples containing neurotransmitters. Due to their structure, carboxyl functionalized packing material is ideal need diol group to analyze by HPLC analysis.

Shodex introduces the HILICpak VN-50 series with neutral carboxyl-type PVA based HILIC solid supports. The packing material is more rugged than similar zwitterion type columns but easier to handle and equilibrate. This series can be used for traditional HPLC and LC/MS applications and shown to analyze neurotransmitters.

Here, five neurotransmitters were analyzed using the HILICpak VC-50 2D with MS.

### **Experimental Conditions:**

A sample containing five monoamine neurotransmitters; noradrenaline, adrenaline, dopamine, serotonin, and histamine was analyzed using a Shodex HILICpak VN-50 2D (2.0 mm ID x 160 mm ID). The column temperature was 40 °C and flow rate was 0.3 mL/min. The eluent conditions were 200mM HCOOH (A) and CH<sub>3</sub>CN (B) using a linear gradient. B% was 60% 0 to 5 min, 60% to 10% for 5 to 6 min, and 10% for 6 to 20 min. An injection volume of 20µL containing 0.1µM of each neurotransmitter in water was used for the experiment. The HPLC system was coupled with an ESI-MS/MS (MRM positive) detector.

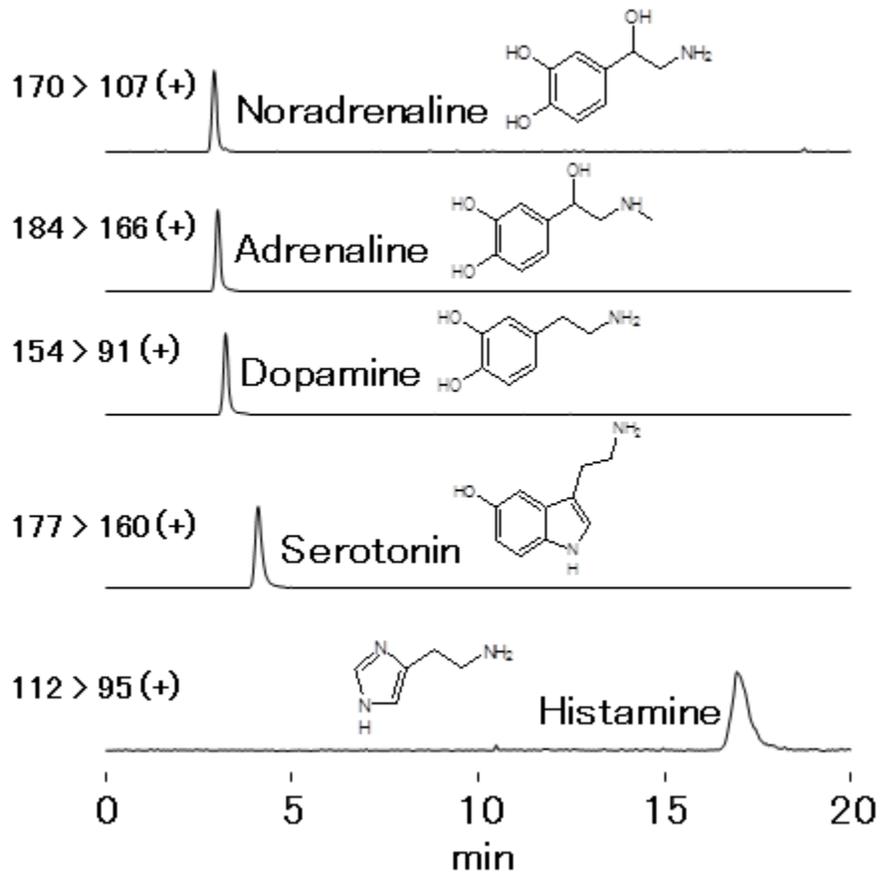
### **Results:**

Five neurotransmitters were analyzed using HILICpak VC-50 2D (2.0mmID x 150mm) (Figure 1). Histamine is more basic than the other monoamines analyzed causing stronger ion exchange interactions between histamine and the packing material causing histamine to elute later.

### **Conclusions:**

Shodex HILICpak VC-50 series are compatible with MS/MS detection. The polymer-based packing material with diol like functional groups allow for the detection of monoamine neurotransmitters.

Figure 1. LC/MS/MS Analysis of Monoamine Neurotransmitters using Shodex HILICpak VC-50 2D.



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