

Aqueous Normal Phase ANP Ballistic Gradients Compared to Same in HILIC - Tips & Suggestions

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Aqueous Normal Phase (ANP) vs. HILIC: Ballistic Gradient Compatibility

When comparing Aqueous Normal Phase (ANP) chromatography to Hydrophilic Interaction Liquid Chromatography (HILIC), one key advantage of ANP is its compatibility with ballistic gradients—a fast and efficient separation technique commonly used in LC-MS workflows.

Why ANP Works Better with Ballistic Gradients

HILIC methods typically rely on a semi-permanent water layer adsorbed onto the surface of standard HPLC-grade silica. This layer is slow to regenerate between runs, making it unsuitable for the rapid changes in mobile phase composition required by ballistic gradients.

In contrast, ANP run on Cogent TYPE-C columns, which are based on silica hydride, do not retain an adsorbed water layer. This allows them to adsorb and desorb mobile phases quickly and consistently, making them ideal for ballistic gradient applications. The result is high precision and reproducibility, even with very fast separations.

What Is a Ballistic Gradient?

A ballistic gradient is a high-speed chromatographic technique designed for ultra-fast analysis—typically under one minute, and up to five minutes. It combines:

- **High flow rates or linear velocities**
- **Rapid gradient changes**
- **Short column lengths**

This approach is especially useful in high-throughput LC-MS environments where speed and efficiency are critical.

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