

# APPLICATIONS

## Improved Reversed Phase Peak Shape of Polar Compound Bronopol and its Primary Degradation Product with a Kinetex® PS C18 HPLC/UHPLC Column

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### Overview

Bronopol (2-bromo-2-nitropropane-1,3-diol) is a common anti-microbial that is used extensively in a wide range of applications, ranging from cosmetic to pharmaceutical products. In the presence of aqueous environment and thermal exposure, Bronopol undergoes a degradation process that is often monitored by reversed phase HPLC with UV-Vis detection.<sup>1</sup> However, because of the relative polarity of bronopol (LogP: -0.20) and its primary degradation product, peak shape can be a challenge. In this application, we compared the peak shape of two core-shell based C18s under identical running conditions and at the same period of time. Both columns used in this example were based on the same core-shell (superficially porous) HPLC/UHPLC particle morphology. The only difference being that the Kinetex 2.6 μm PS C18 incorporates a covalently bonded positive functional group on the surface of the silica gel that promotes enhanced polar selectivity and improved peak shape for polar compounds. A reference standard of bronopol was exposed to thermal degradation and **Figure 1** is a overlay comparison of the relative peak shape for bronopol and its primary degradation product on both columns.

### LC Conditions

- Columns:** Kinetex 2.6 μm PS C18  
Kinetex 2.6 μm C18
- Dimension:** 50 x 4.6 mm
- Part No.:** [00B-4780-E0](#) (PS C18)  
[00B-4462-E0](#) (C18)
- Recommended Guard:** SecurityGuard™ ULTRA
- Guard Cartridge Part No.:** [AJ0-8949](#) (PS C18)  
[AJ0-8782](#) (C18)
- Guard Holder Part No.:** [AJ0-9000](#)
- Mobile Phase:** Methanol with 0.1 % Phosphoric Acid/Water (5:95)
- Flow Rate:** 1.25 mL/min
- Temperature:** 30 °C
- Detector:** UV-Vis @ 210 nm
- Sample:** 1. Bronopol  
2. Degradation Product

### Bronopol

Molecular Formula: C<sub>3</sub>H<sub>6</sub>BrNO<sub>4</sub>

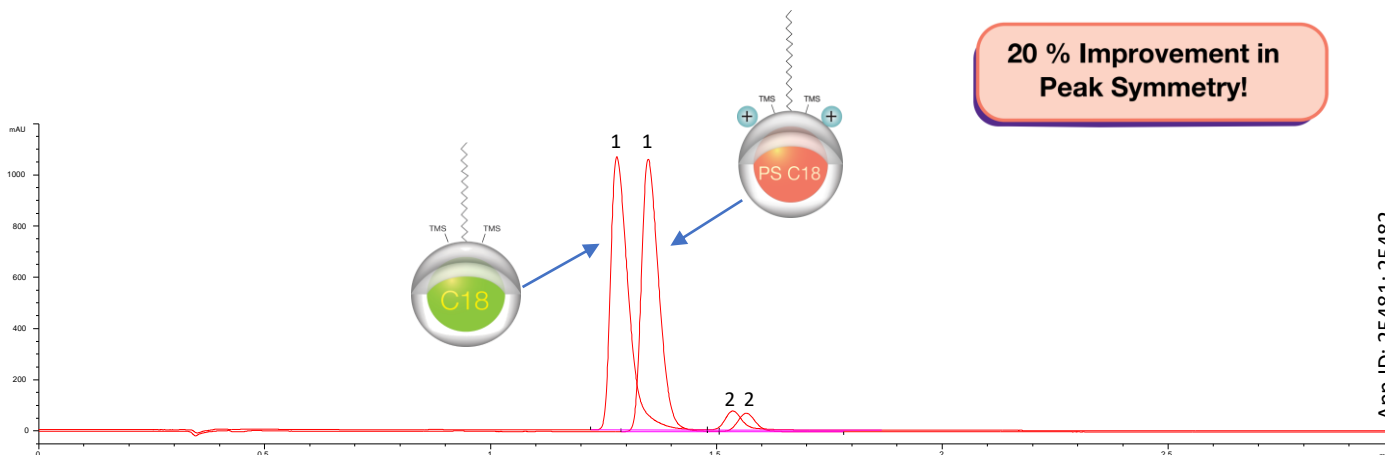
Acidic pKa: 12.94

LogP: -0.20



**Figure 1.** Comparison of Thermally Degraded (60 °C) Bronopol on Kinetex PS C18 and Kinetex C18.

**20 % Improvement in Peak Symmetry!**



App ID: 25481; 25482

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## References

1. Huafu Wang, Gordon J Provan, and Keith Helliwell. Determination of bronopol and its degradation products by HPLC. *J. of Pharma. and Bio. Anal.* 2002, 29(1-2), 387-392.

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