

Objective: To study effect of N₂ purity on the baseline noise of NDMA molecule (for 75<43 transition) by using Hydrocarbon filter.

Background:

In July 2018, the U.S. Food and Drug Administration (FDA) announced that the carcinogenic impurities: N-nitrosodimethylamine (NDMA) and N-nitrosodiethylamine (NDEA) had been detected in Valsartan bulk drug substances manufactured by Chinese drug manufacturer. Among the all nitrosamines, it has been observed that NDMA molecule is quite challenging on LCMS system due to its low molecular weight and the high baseline noise to the 75<43 transition (Quantifier).

It has been observed that there are many parameters which could contribute to this baseline noise of the NDMA such as mobile phase quality, system contamination, N₂ purity etc.

In this document, we have tried to evaluate the effect of N₂ purity on the baseline noise of the NDMA transition (75<43) by using the hydrocarbon filter.

Observations:

Analysis was performed under same conditions with and without the hydrocarbon filter. All solvents used for this evaluation were LCMS grade only.

Catalog No.	226-50720-00		LC/MS HYDROCARBON KIT Up to 20 U/min. of hydrocarbon-free nitrogen per minute with this LC/MS High Flow Kit
Usable for	Benefit		
LC/MS	Greater sensitivity		

226-50720-00	Shimadzu Carrier Gas Filter Kit for LC/MS LC/MS HYDROCARBON KIT - HIGH FLOW HYDROCARBON FILTER KIT, 1/4" BRASS, - 2 HIGH FLOW HYDROCARBON FILTERS, 1 BRASS PARTICLE FILTER
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A) Parts inside the box



B) Actual installation



NDMA baseline comparison is given in figure 1. Here, almost four times improvement in baseline was observed.

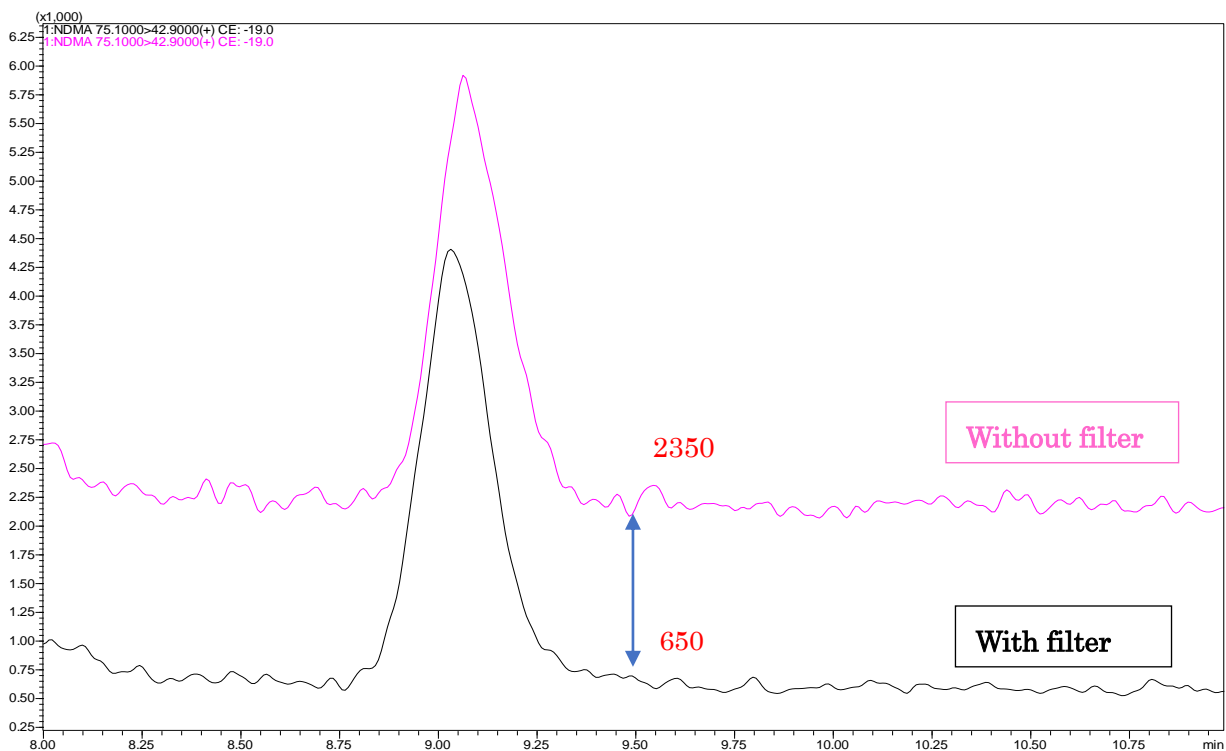


Figure 1: NDMA (75>43 transition) baseline noise comparison with & without filter

Discussion/Conclusion:

- The four times improvement in the baseline noise was observed between with and without hydrocarbon filter for NDMA.
- The results were found to be highly repeatable.
- The long-term evaluation of this hydrocarbon filter is necessary to confirm its applicability and durability.