chemtos NEWS

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Dear reader,

It has been a while since the last Chemtos Newsletter was emailed.

Let's revisit a topic that was discussed a few years ago. **Which analysis should be included in an organic compound Certificate of Analysis (CoA)**, and why it is dependent on the end use of the product.

"the WHO" First, we need confirmation of the molecular structure listed on the CoA. Typically, at least two corroborating analyses are needed. 1D and 2D NMR analyses usually provide independent confirmation of molecular structure, but often times just 1D proton NMR provides semi-independent molecular structure confirmation. Other analytical techniques that can provide molecular structure confirmation include FT-IR, GC-MS, and Triple-quad MSD as long as reference data is available for comparison. Single Quad Mass spectrometer-based m/z values are orthogonal and provide independent confirmation of the molecular structure. Chiral compounds may need confirmation via chiral HPLC or specific optical rotation value.

"You are so fast. This is much appreciated." - 02/02/2026

"the HOW MUCH" This refers to the weight fraction potency of the organic compound listed in CoA, after disregarding counter-ions, impurities, inorganics, and residual solvents/water. Is it 70%, 80%, 90%, 95%, 98%, or 100%? This value determination is often the source of problems. The old way was to use different analytical tools to detect and estimate weight fraction of everything else other that the main compound. The problem is that not all such analyses provide weight percent values and if any of the analysis is not done, the calculated value could have a large error. Note that HPLC purity is not equivalent to wt% potency. The new way is to directly determine the weight fraction of the organic compound using "qNMR" analysis. That is the quickest and provides accurate weight % potency value, but NMR does not necessarily detect all the other possible things that could be present. The tolerance for possible error in the potency value is related to end use of the product. For Stable Isotope Labeled (SIL) compounds there may be a higher tolerance for potency variance due the way it is used in Triple Quad MS bio-analysis.

"THANKS. You're awesome."

"the NOT TO BE PRESENT" This refers to impurities that can have an outsized toxic or biological response. These could be trace amounts of metals/ions/bacteria/ virus/parasite/peptides/biologics/etc. These should not be present in compounds that are administered to humans or animals, such as in GMP manufacturing certified compounds. These trace impurities are not a major concern for "Analytical reference standards" (Chemtos Products).

A more detailed discussion of analyses for CoA can be found here: https://www.chemtos.com/CoA_Ref_Stds_2026.pdf

"Thank you so much! I appreciate the outstanding turnaround time." – 07/14/2023

"the growing popularity of the qNMR technique you introduced us to. I have to say, since you educated us about its utility, it makes purity determinations MUCH easier." – 05/17/2022

NMR and qNMR Services

We, at Chemtos, can accurately determine weight fraction of an organic compound in either a solid powder or in a solution of a volatile solvent. We have spent years optimizing our processes for accurate qNMR analysis using 5-10 mg of sample. The process to submit sample for analysis is simple via a web submission form. NMR Services at Chemtos

Custom Synthesis of Ref Stds

With years of combined experience in varied chemical synthesis processes and isolation techniques, we have been able to synthesize and isolate compounds and metabolites at high purity, often in short time duration (typically less than 4 weeks). We find innovative ways to insert stable labels in the reference standards that we synthesize, even when others have struggled! We are DEA licensed with quotas for manufacture of C-I through C-V compounds.

Analytical Services

Our typical GLP Certificate of Analysis generation includes (i) UV HPLC Purity; (ii) LC-MS m/z confirmation; and (iii) Proton qNMR analysis for molecular structure confirmation and wt% potency value. We also offer other analytical analysis such as KF titration, Residue on Ignition, Chiral HPLC, FT-IR, GC-MS, and Optical Rotation analysis.

Catalog of in-stock Ref Stds

We carry a number of Certified Analytical Reference Standards in-stock (not for human consumption). All are accompanied by a comprehensive CoA that includes copies of the analytical data and have accurate potency value determined using qNMR. We also offer DEA Exempt 1 ml solutions of analytical reference standards in flame sealed ampoules whose concentration has been confirmed by proton qNMR analysis.

Our web catalog can be found at Chemtos Web Catalog. Use of Search bar on top right is quite effective in finding compounds by name or CAS number.

Please do not hesitate to contact us if we can be of any assistance in fulfilling your Certified Analytical Reference Standard or Compound Re-certification needs. We are at your service whenever you need us.

Sincerely,

Khalid Thakur

chemtos

Chemtos
16713 Picadilly Ct
Round Rock, TX 78664
Main: 512.686.4444

khalid.thakur@chemtos.com