



*"Thank you very much for the quick turnaround on this!" - 09/06/2023*

*"THANKS. You're awesome." - 07/26/2023*

Hope your year has made a great start! Best wishes for an excellent 2024!

I want to revisit a topic I have discussed in a newsletter a few years ago.

We can accurately determine weight fraction of an organic compound in either a solid powder or in a solution of a volatile solvent by a technique commonly known as "Quantitative Proton NMR" or "qNMR". That weight fraction value is also the weight percent potency in a reference standard. This value is determined by:

- 1) Addition of a different well characterized secondary compound that is accurately weighed in to known weight of sample to be analyzed;
- 2) Dissolution in appropriate deuterated NMR solvent;
- 3) Proton NMR data acquisition with long recycle time between subsequent scans to ensure that each NMR resonance integral value accurately matches the number of protons present at each distinct NMR chemical shift.
- 4) Accurate data processing and comparison of integral intensity of resonance from compound of interest and that of added secondary compound to determine weight fraction potency of the compound of interest.

Recent open access references using this Proton qNMR analysis include:

- 1) <https://www.sciencedirect.com/science/article/pii/S0731708522004940?via%3Dihub>
- 2) [https://www.jstage.jst.go.jp/article/cpb/70/3/70\\_c21-00668/\\_article](https://www.jstage.jst.go.jp/article/cpb/70/3/70_c21-00668/_article)
- 3) <https://academic.oup.com/jaoac/article/104/2/506/5912010>

This qNMR method independently determines accurate weight fraction potency value, unlike the traditional methods that utilize various analytical tools to estimate weight fraction potency.

An old presentation that covers this discussion of CoA of organic compounds can be found here: [https://www.chemtos.com/RefStd-CoA\\_discussion.pdf](https://www.chemtos.com/RefStd-CoA_discussion.pdf)

All of the analytical reference standards that we offer have this qNMR determined weight fraction potency values listed on their CoA. We also offer such analysis and re-certification of reference standards as an analytical service.

<https://www.chemtos.com/index.php/analytical-services/analytical-price-list>

We at Chemtos 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

*"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*



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 for use as analytical reference standards.

## Analytical Services



Our standard/basic GLP Certificate of Analysis includes (i) UV HPLC Purity assessment averaged over multiple absorbance wavelengths; (ii) LC-MS for confirmation of molecular weight; and (iii) Proton NMR analysis for molecular structure confirmation and residual protonated organic solvent determination. We also offer Quantitative proton NMR (qNMR) for weight fraction potency value, KF titration for moisture content, Residue on Ignition for non-combustible inorganic salt content, Chiral HPLC 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 using 2x quantitative proton NMR (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**



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