

Introduction

The analysis of metals in cannabis has been difficult for many labs because of a lack of official methods in the industry. In August 2021, AOAC adopted an ICP-MS method for the determination of arsenic (As), cadmium (Cd), mercury (Hg), and lead (Pb) in a variety of cannabis and cannabis-derived products. The new method is adopted as an Official Method of Analysis in First Action status. This AOAC method has undergone rigorous assessment by the AOAC Expert Review Panel (ERP) and achieved consensus through AOAC members.

The authors have also worked with ASTM and the D37 Cannabis community to have the first ASTM standard test method for the analysis in Metals in Cannabis.

Instrumentation

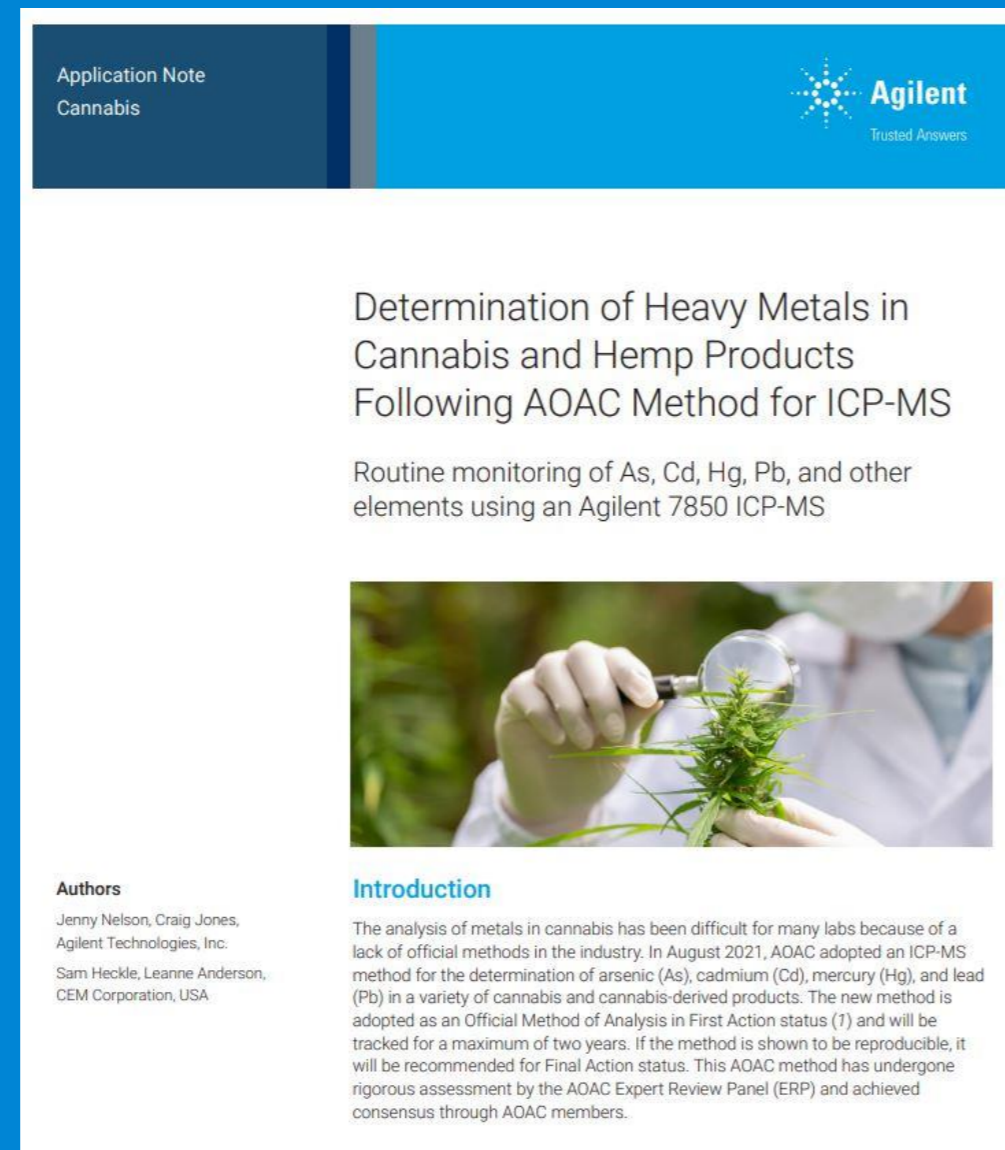
The 7850 ICP-MS, with the Ultra High Matrix Introduction (UHMI) system and ORS⁴ CRC, was used for the analysis. The Agilent SPS4 autosampler was used. The 7850 was configured:

- MicroMist glass concentric nebulizer
- Quartz spray chamber
- Quartz torch with 2.5 mm id injector
- Nickel-plated copper sampling cone and a nickel skimmer cone

Parameter	Value
RF Power (W)	1600
Sampling Depth (mm)	10
Carrier Gas (L/min)	0.80
Dilution (UHMI) Gas (L/min)	0.15
UHMI Setting	4
Helium Cell Gas (mL/min)	4.3
KED (V)	3.0



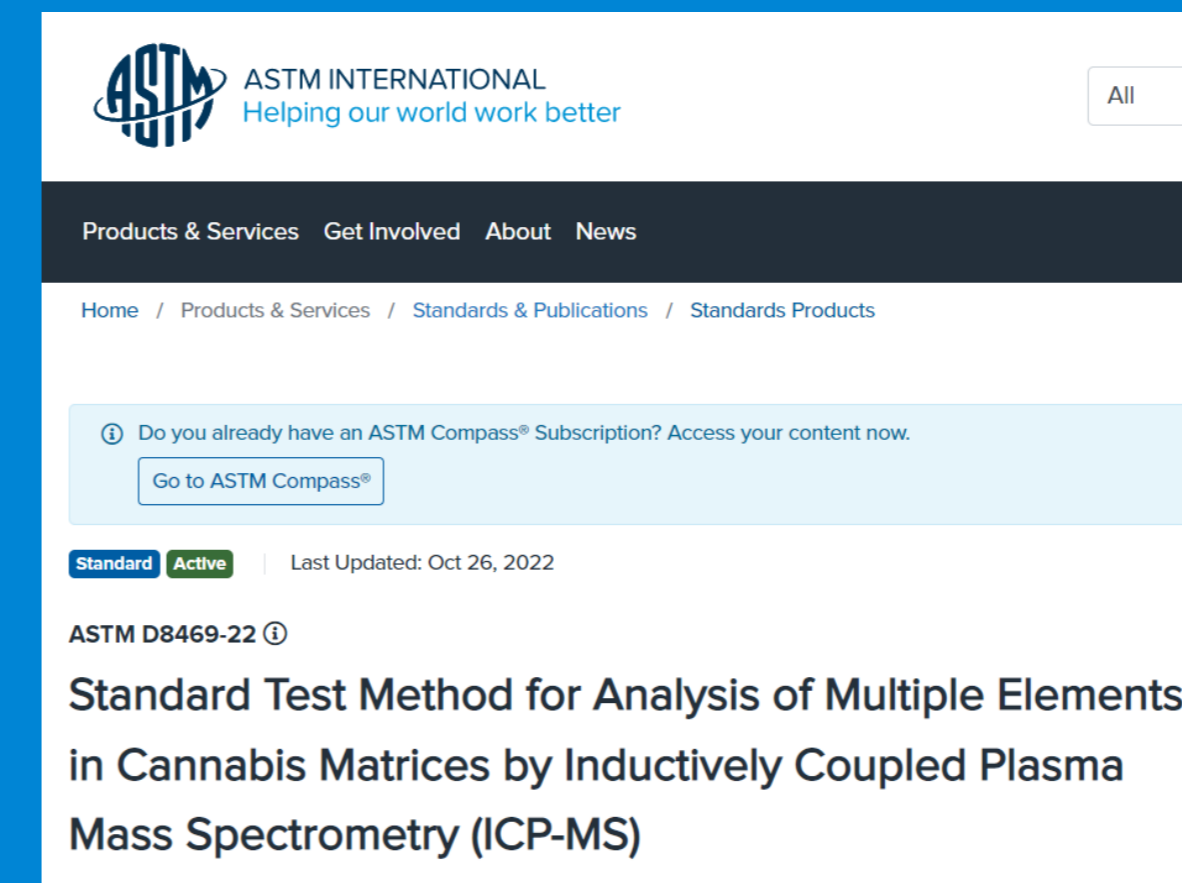
Two New Standardized Methods for Metals in Cannabis from AOAC and ASTM



← Take a picture to download the full AOAC Application Note

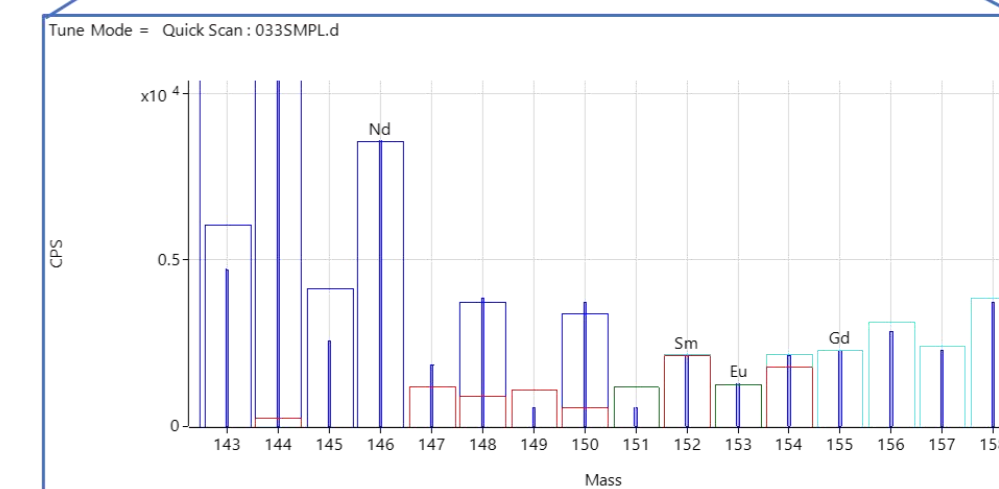
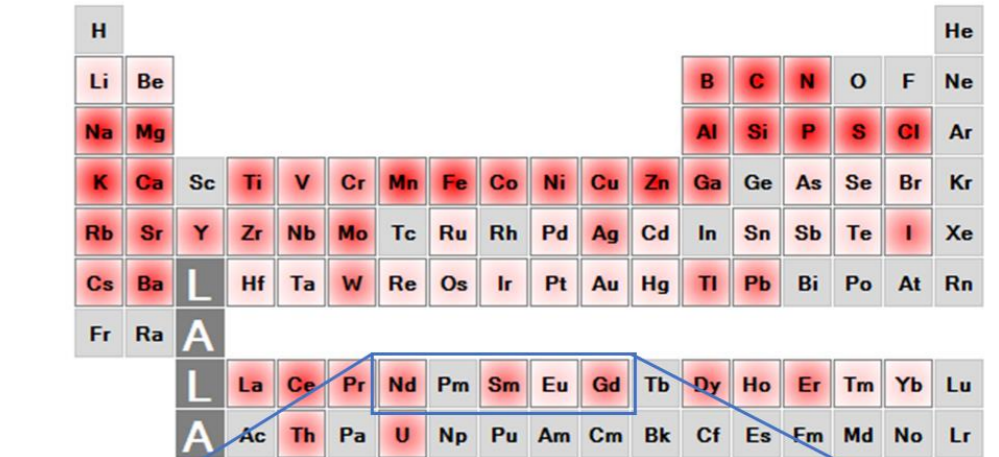


Take a picture to link to ASTM →



Results and Discussion

In addition to the quantitative analysis, IntelliQuant data was also acquired to provide semiquantitative results for other elements. Some plant materials can accumulate high enough levels of less typical elements to cause unexpected and unusual interferences. One example is if the rare earth elements (REEs) are present at high enough concentration in a sample they can form doubly charged ion (REE²⁺) interferences. From this data, and many other Cannabis samples we have analyzed, we see Rare Earth Elements (REE) present, see below.



Conclusions

- The first standard test methods have been completed with both ASTM and AOAC.
- Both methods are for the determination of As, Cd, Hg, and Pb and additional optional elements in cannabis samples.
- The accuracy of the methods was evaluated by analyzing four plant-based SRMs and conducting a spike recovery test at different concentration levels for As, Cd, Hg, and Pb in four cannabis samples.