



Editorial: Trends in analytical methods for customs laboratories

With the rapid growth of global social relations, human beings are now interconnected on a planetary scale to degrees not previously known. This has raised numerous headline issues for public policy. Within-world exchanges are greatly facilitated by international commercial treaties with customs laboratories playing a key role in antifraud operations. There are numerous situations where accurate controls are required, notably in determining the authenticity and origin of products, in detecting illegal imports like narcotics and their precursors, in protecting consumers against dangerous goods, counterfeited drugs or contaminated food, in safeguarding the environment and endangered species etc. Depending on the size of the lab, the number of samples to be analyzed can vary from a few hundreds to around 30,000 per year for the biggest labs.

Given the complex, diverse and huge numbers of samples to be analyzed, there is a constant need for up-to-date, reliable and readily implemented analytical methods for customs laboratories when they are dealing with various daily customs issues, namely authenticity and quality controls, consumer health protection and environmental controls.

Customs laboratories typically implement official analytical methods and international standards but also in-house developed methods. These laboratories also closely collaborate with universities and research teams for the development of innovative and improved analytical methods and in building up and improving existing official methods. The customs laboratories need many types of equipment in their day-to-day work. These vary from relatively low-tech items, like wet volumetric titration, to much more high-tech equipment, requiring specialized operating and sensitive handling. Customs labs must indeed maintain a

state-of-the-art service. New analytical methods used to solve the issues faced by customs laboratories include MS, NMR, liquid scintillation counting (LSC) and instrumentation automation. The testing and implementation of handheld equipment, on site at the border, is of increasing importance and has already proved successful for Raman, XRF (X Ray Fluorescence) and infrared (NIR, MIR) technologies in the search for narcotics, new psychoactive substances, precursors and dangerous chemicals.

The list of equipment that analytical laboratories have at their disposal is large and their performances are updated at a good pace. This instrumentation includes densimeters and polarimeters, liquid and gas chromatographs coupled with mass-selective detectors, along with FTIR (Fourier transform infrared spectrometry), UV/Vis (ultraviolet-visible spectrophotometry), XRF and LSC etc. The present special issue gathers a series of publications devoted to innovative analytical methods suited to customs laboratories with a special focus on applications and required performance criteria.

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