



TracInvent AS

Tracers for Authentication of Edible Oils and Wine

Concept of using Tracer Technology for Authentication of Edible Oils and Wine

- Tracers are used in many different fields, for instance in petroleum exploration and in medical studies. Tracers can usually be detected at extremely low concentrations, and relatively small amounts can be applied for studying for instance fluid flows in petroleum wells and reservoirs. In medicine tracers can for instance be applied for detections of cancer cells.
- Tracers that have been found to have no reverse health effect on human beings can be applied as food additives at low concentrations. In this way a product can be tagged, and it will open up the possibility for identification of fake products or for disclosure of dilution with other products of lower quality.
- In the concept of using oil soluble tracers for authentication of edible oil, tracers are added to the oil product during the production process
- For authentication of wine water soluble tracers can be added

- The oil or wine product can be marked with various concentration ratios of tracers unique for each product or batch. In this way the product or batch can be identified by performing a chemical analysis
- If a high quality product has been mixed with other products of lower quality, it can be discovered due to the resulting lower concentration of tracers that will be present compared to the original product
- Tracers added at a level as low as 10 parts per trillion or 10 μg per cubic meter can be detected in for instance olive oil
- It should be easy to understand that addition of tracers at such a low level will have now reverse effect on the quality or taste of the product since the tracer itself has no significant taste or odor
- Neither will the tracers have any reverse effect on human health or on the environment and they will be broken down over time. A similar type of tracers have been used in human in-vivo studies and they should therefore be safe for application in small quantities in food products
- Three different tracers have been tested so far for stability and determination of detection limit in olive oil and two tracers have been tested for red wine



- The tracers can be analyzed by applying robust and relatively uncomplicated analytical instrumentation and methodology
- Because of the low concentration level the tracer cost will be negligible
- The tracers are chemically and thermally stable compounds, and when added to olive oil or red wine, preliminary tests showed that the concentration is stable for several months
- Figure 1 shows a plot from analysis of 3 different tracers in olive oil at a concentration of 1 mg/m^3
- Figure 2 shows a plot from analysis of two different tracers added to red wine at a concentration of 5 mg/m^3
- Figure 3 is a photo of 2 mg of one of the tracers
- For edible oils it will be sufficient to add tracers at a concentration of 1 mg/m^3 or even lower, while for red wine $1\text{-}2 \text{ mg/m}^3$ will be sufficient
- Adding such low amounts will have absolutely no effect on the taste of the products

- Assuming that addition of such small amounts of these non-toxic tracers can be accepted by health authorities, it is likely that olive oil and wine producers will be interested in application of tracer technology to protect their products
- The idea of applying tracers from a certain family of tracer compounds as additives for edible oils and wine was invented by TracInvent AS, and methods for analyzing the tracers at extremely low levels have been developed
- Considering the increase in price for extra virgin olive oil, especially due to draught problems in Mediterranean countries, the likelihood that fake products will appear on the market is becoming larger.
- More information about the technology can be obtained by contacting TracInvent AS on e-mail h.stray@online.no

Analysis of non-toxic tracers in olive oil

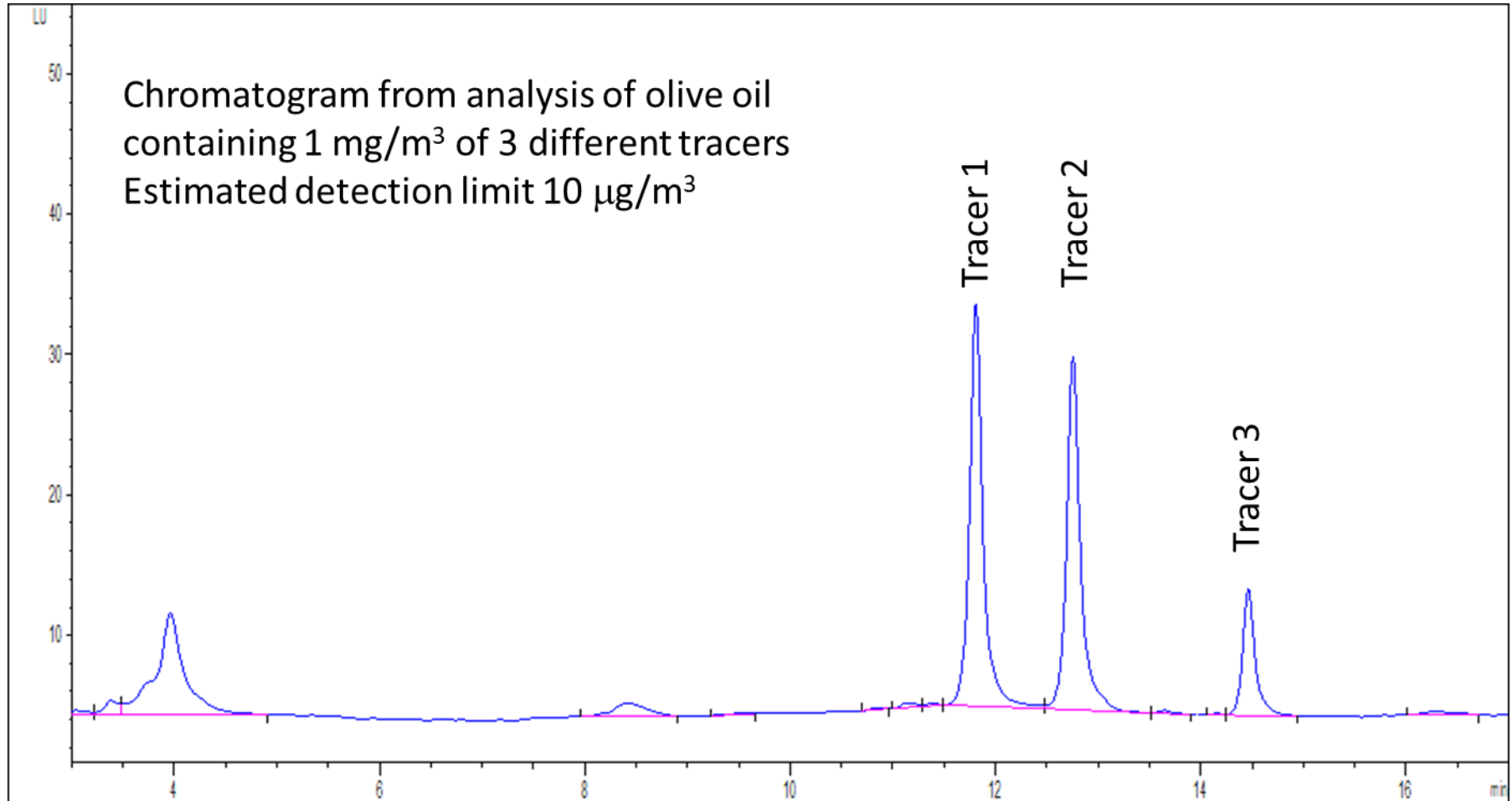


Figure 1

Analysis of non-toxic tracers in red wine

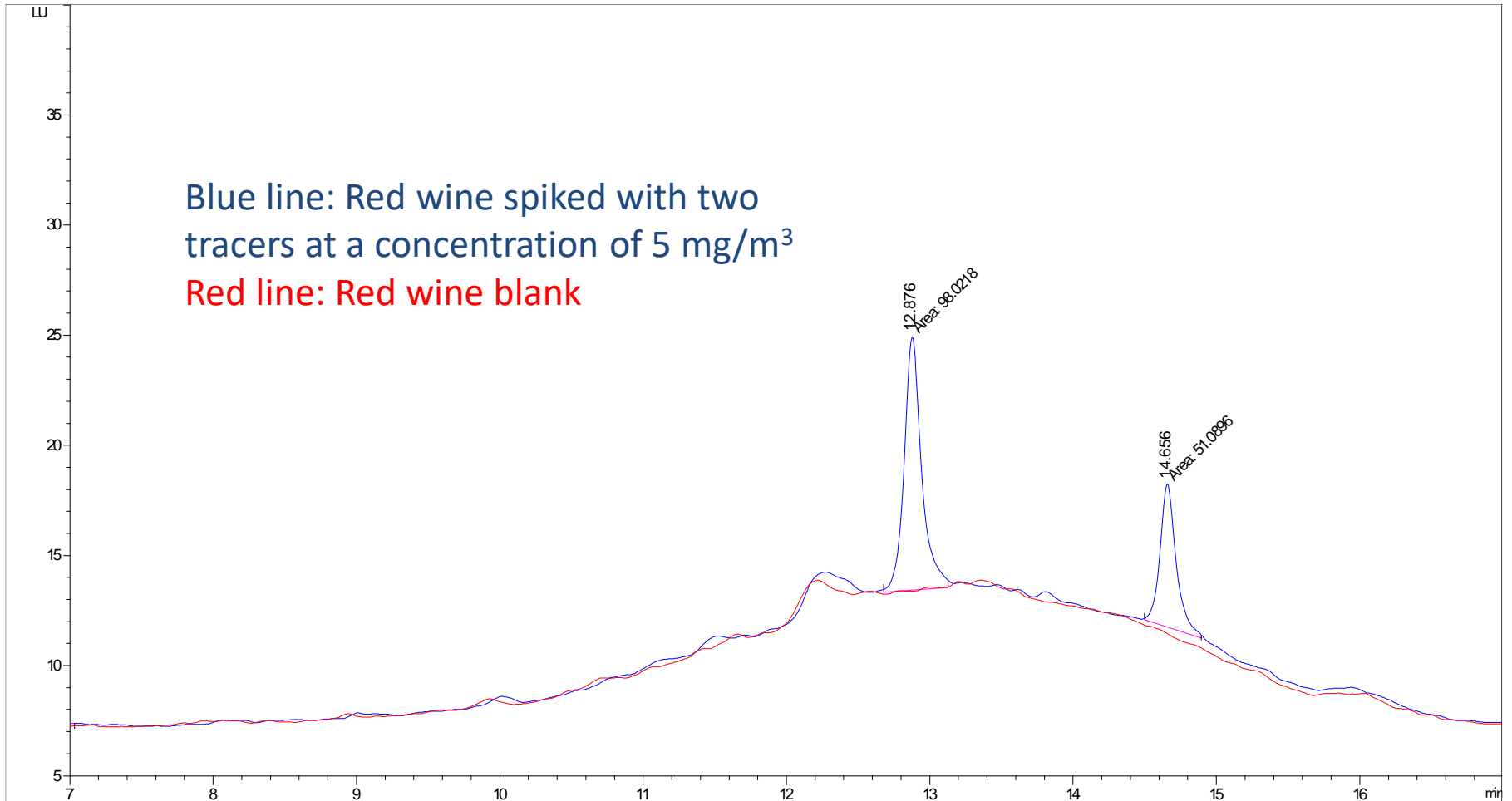


Figure 2

Photo showing 2 mg tracer

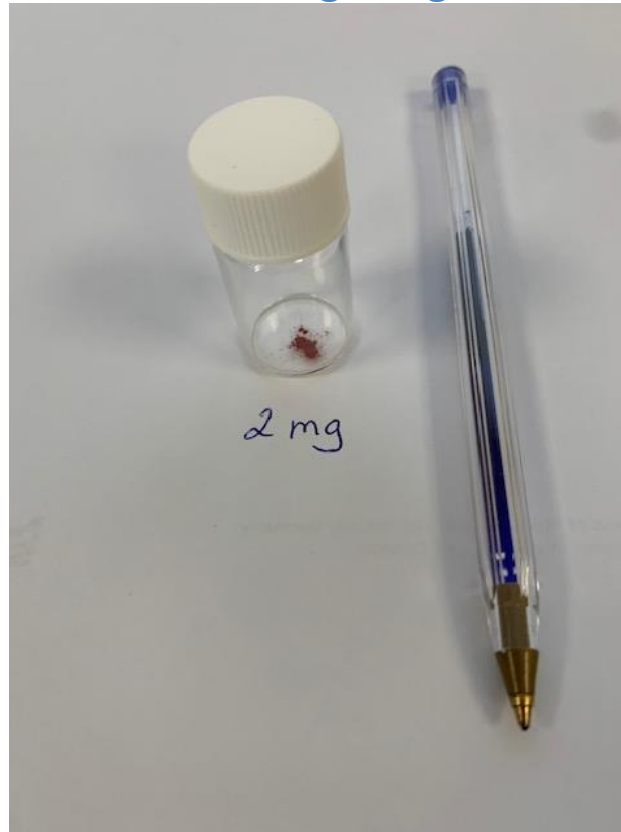


Figure 3