

## Authentication of old bottles of fine wine.

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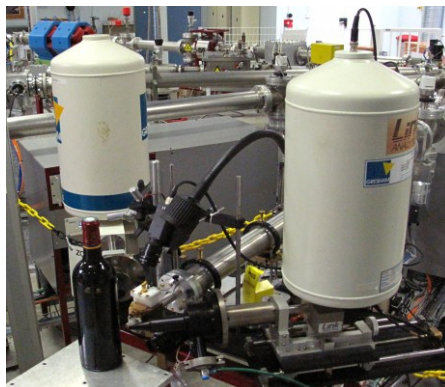
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The aim of this presentation is to present two physical analysis methods which are able to authenticate old bottles of fine wine. The advantages of this approach is to allow non-destructive assessments (that is to say without opening the bottle) to estimate, on the one hand the age of the wine, and on the other hand the date of manufacture of the bottle.

The first step is to determine the caesium 137 (Cs-137) content in the wine by ultra-low radioactivity measurement, and in a second step, determine the chemical composition of the glass of the bottle by Particle Induced X-ray Emission (PIXE) method.

The two approaches are based on comparison of the results obtained on the appraised bottle, to reference data obtained previously in the laboratory on certified flacons. Furthermore, a Principal Component Analysis is apply on PIXE data for determination of the age of the bottle, if no original reference is available.

This development is now available in the unit of technology transfer “ARCANE” of the CENBG, to track down forgeries for various customers : owners of Grands Crus, collectors, auction houses, fine wines merchants...



*Experimental setup of PIXE analysis on AIFIRA platform*