

LABORATORY: CNR-SCITEC

NAME OF THE INSTRUMENT

Micro & macro-Raman with laser excitation at 532 and 785 nm

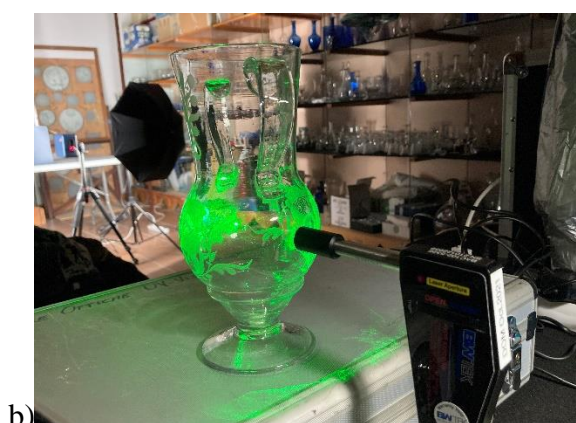
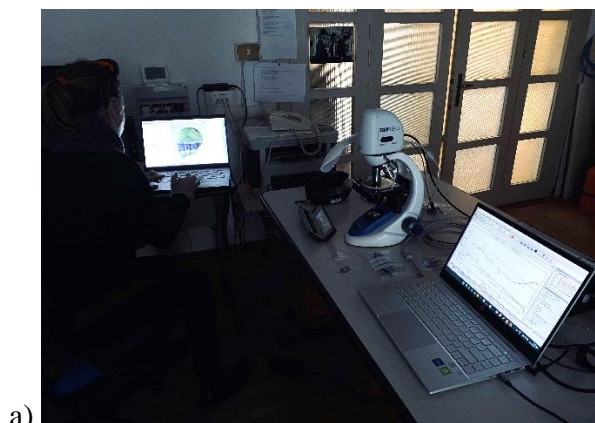
GENERAL DESCRIPTION:

Raman spectroscopy is a molecular vibrational spectroscopic technique which provides complementary information to FT-IR. It is used in the cultural heritage field for the vast identification and characterization of inorganic and/or organic materials. The main drawback of this technique is related to high fluorescence emissions which may compete with the scattering phenomena and cover any useful vibrational signals especially when using short wavelength laser sources. A multi laser source is then preferred to investigate the different typologies of Cultural Heritage objects. The 532 nm laser system in a micro-Raman set-up is particularly adapt to low fluorescing inorganic-based substrates, such as ceramics, bronzes, minerals, gems, and stone materials. The longer wavelength excitation system (785 nm), instead, works better for investigating organic-inorganic composite objects.

TECHNICAL DETAILS:

The portable Raman i-Raman Plus by BWTEC is equipped with two laser sources at 532 and 785 nm and two dedicated CCD detectors TE cooled. It can work with an optical fibre probe (two probes for the 532 and 785 nm lasers, 1.5 m length) for performing Raman measurements on 90-100 μm spot. It can be also coupled with a micro-probe equipped with different objectives thus obtaining different lateral resolution (4x, 20x, 40x e 80x reaching sampling spot of 300-400, 90-100, 40-50 e 15-20 μm , respectively), the micro-probe set up is also equipped with a camera for visualizing the sample. The acquirable spectral range is 65-4200 cm^{-1} . The laser power can be modulated by software with 1% step of the nominal power (40-50mW for the 532 nm and about 300mW for the 785nm excitation).

Figure: In situ set up of the portable i-Raman Plus by BWTEK with excitation laser at 532 nm, a) micro-Raman set up b) set up with the fibre optic probe.



MAGGIORI INFORMAZIONI:

- J. Anal. At. Spectrom., 2011, 26, 2500–2507
- J. Raman Spectrosc. 2011, 42, 407–414

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