MICRO-RAMAN SPECTROSCOPY AND VP-SEM/EDS TECHNIQUE APPLIED TO THE CHARACTERIZATION OF INORGANIC PARTICLES, FIBRES AND ASBESTOS BODIES IN HISTOLOGICAL SECTIONS USED FOR RESPIRATORY DISEASE DIAGNOSES

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The correlation between inhaled fibrous material, in particular the mineral phases defined by the law as "asbestos", and diseases of the respiratory system - asbestosis, mesothelioma, pulmonary carcinoma - is largely demonstrated by a large scientific literature. Previous work carried out in our laboratories proved that micro-Raman spectroscopy is a technique able to recognize crystalline phases on untreated samples. In particular recently micro-Raman spectroscopy has been coupled with VP-SEM/EDS- Variable Pressure Scanning Electron Microscopy with annexed Energy Dispersive Spectroscopy - to characterize, without digestion of the biological matrix, particles/fibres directly in the histological sections used for the medical diagnoses. A methodology allowing the characterization of the same particle/fibre under the two techniques has been developed. Thin sections of lung tissue and pleural plaque from patients affected by the above respiratory diseases have been studied. All the inorganic phases, fibrous or not, and the "asbestos bodies", observed under the optical microscope, has been undergone to spectroscopic, using 632.8 nm laser beam as excitation source, and morphological-chemical study under VP-SEM/EDS. The results are presented and discussed.

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Keywords: micro-Raman spectroscopy, asbestos bodies, histological sections