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Quantitative determination of N.O.A.: towards a better methodology

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Due to the widespread presence of Naturally Occurring Asbestos that are currently being excavated for numerous construction projects (railway lines, motorways etc.), the problem of human exposure and the management of contaminated material are increasingly problems on the routinely agenda. Environmental NOA exposure is known to cause several types of lung disease. Human health can be damaged by inhaling fibers when they become airborne due to weathering or human activities that produce dust. The production of huge amounts of natural material containing asbestos is a complex problem to deal with, particularly during tunneling opera or excavation works. In this context, the quantitative determination of the content of asbestos in rock matrices, became extremely important but is a complex operation that is susceptible to significant errors.
During more of 15 years of activity of the Asbestos Laboratory of the Politecnico of Turin, thousands of natural samples have been examined: soils, rocks, rail ballast, talcs, etc. Morevore, in addition to the routinely work, in the last 5 years of activity of monitoring and environmental analysis in the context of the tunneling opera of the "Terzo Valico" in the Ligurian Appennine, we had the opportunity to face with thousands of different samples, trying to develop the best possible methodology using different techniques analysis. The quantification of the asbestos content near the threshold defined by the current law in act of 1000 mg/Kg corresponding to the 0,1 % is a challenging problem that we have deal with:
• Validation of PCOM methodology for quantitative determination of Naturally occurring asbestos concentration
• SEM analysis and cross-referenced analysis with PCOM
• Trials and experiments on the morphology variation of the crystalline habit of prismatic and fibrous amphiboles subjected to grinding test
Although we are satisfied with the experience and results obtained, we believe it is necessary to continue to develop the knowledge of the subject and to interface with other research groups. Several recent studies show the potential use of other technologies.
Thanks to regional co-financing, we are integrating MicroFTIR and MicroRaman in our Laboratory with the hope of growing a network of knowledge in this field as complex and fascinating as the asbestos presence in nature.