

La componente “silice” nel PM10 di un ambiente urbano

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KEY WORDS

Silica; PM10; electron microscopy

SUMMARY

«*The “silica” component in the PM10 of an urban site*». **Background:** *In vivo and in vitro toxicological studies have shown that the aged fractured crystalline silica, which is a component of airborne particulate, exerts an important inflammatory action on airways. The evaluation of the concentration level of airborne crystalline silica in an urban area is an important research subject in order to determine the exposure levels of the general population.*

Objectives: *The aim was to study the seasonal trend of the quartz (the most common form of crystalline silica) concentration levels in the particulate inhalable fraction (PM10) in the urban area of Rome.* **Methods:** *PM10, sampled by a cascade impactor, was analysed by scanning electron microscopy, equipped with a thin-window system for X-ray microanalysis (SEM/EDX) for qualitative analysis. Parallely the concentration levels of quartz in the particulate were determined by X-ray diffractometry (XRD) for quantitative analysis, using the NIOSH 7500 method (NIOSH, 1994).* **Results:** *From September 2004 to October 2005 the abundance of silica particles, evaluated by SEM/EDX was in the range 1.6÷10.4%, with a concentration level of free crystalline silica in the range 0.25÷2.87 µg/m³. The equivalent diameter of silica particles ranged from 0.3 to 10.5 µm, moreover, more than 87% of particles showed a diameter less than 2.5 µm.* **Conclusions:** *The correlations between SEM/EDX and XRD data seem to suggest that the airborne silica particles in the urban location studied consisted mostly of crystalline silica. Moreover, the data suggest the existence of a significant contribution of silica particles due to south-west wind carrying a fine dust from the Sahara desert to Mediterranean Europe.*