

# Caratterizzazione della frazione carboniosa dell'inquinamento particellare nell'area urbana di Roma

## Parte I

P. AVINO, M. MANIGRASSO

Laboratorio Chimico dell'Aria, DIPIA Istituto Superiore per la Prevenzione e la Sicurezza del Lavoro (ISPESL), Roma

### KEY WORDS

Particulate Matter; carbonaceous fraction; radon

### SUMMARY

**«Identification of the carbonaceous fraction of particulate matter pollution in the urban area of Rome - Part I».**

**Background:** Particulate Matter pollution in urban areas is due to different sources and varies in composition, where the carbonaceous fraction is of particularly importance due to its effects on human health and the climate.

**Objectives:** to study the contribution of the carbonaceous fraction in PM10 pollution in the urban area of Rome and identify the composition of its organic fraction. **Methods:** Separation of Elemental Carbon (EC) from Organic Carbon (OC) was carried out by means of a 5400 Ambient Carbon Particulate Monitor 5400 based on a two-step combustion procedure.

**Results:** The carbonaceous fraction in central Rome accounted for 30-40% of PM10 at ground level and consisted of 60-70% Elemental Carbon and 30-40% Organic Carbon. Polycyclic Aromatic Hydrocarbons, n-Alkanes and n-Alkanoic acids were identified among the constituents of the OC fraction, sulphates, nitrate and ammonia in the hydrosoluble inorganic fraction and heavy metals (Cd, Cr, Fe, Ni, Pb, V, Zn) in the non-hydrosoluble inorganic fraction. PM10 temporal trends were interpreted using measurement of the natural radioactivity (radon and its short-lived decay products) as tracer of the dynamic properties of the atmospheric boundary layer. **Conclusions:** Carbonaceous particulate matter is a fundamental parameter to evaluate atmospheric pollution due to combustion processes and can be considered as a specific index of motor vehicle traffic pollution. Its separation into elemental carbon, of primary origin, and organic carbon, of both primary and secondary origin, is toxicologically significant and in order to study the formation mechanisms of photochemical pollution.