motor vehicles. Filter samples were extracted with dichloromethane to isolate the non-volatile organic material for radiocarbon analysis, because this material potentially includes carcinogenic compounds that may pose a risk to human health. The extract was also subjected by the US Environmental Protection Agency (EPA) to mutagenicity testing to determine its bioactivity. The $^{14}C$ results showed that RWC was the dominant contributor to this chemical fraction obtained at two receptors (sampling sites) and during both day and night. Ancillary $^{14}C$ and composition measurements of total carbon, elemental carbon and the polycyclic aromatic hydrocarbon fraction were obtained from a few select samples. These results and details of the chemical separations will be presented.

COSMIC-RAY GENERATION DURING THE SUPERNova EXPLOSION

G E KOCHAROV, A N KONSTANTINOv and VA LEVCHENKO

Leningrad State Technical University, Leningrad 195251 USSR

A synchronous increase in the $^{10}$Be and $^{14}C$ production rate in the Earth's atmosphere 30,000–40,000 years ago has been discovered. The time profile and amplitude increase show that a proper source of increased intensity of cosmic rays was located not far from the solar system ~50 pc. The most probable source is a supernova explosion.

SCHWABE CYCLE MANIFESTATION IN RADIocarbon ABUNDANCE IN ANNUAL TREE RINGS

G E KOCHAROV and A N PERISTYKH

Physical-Technical Institute of the USSR Academy of Sciences, Leningrad 194021 USSR

Annual data on $^{14}C$ abundance in tree rings over the period, AD 1700–1940, are considered. We show that the obtained hyperfine structure consists of 10–12-year components. Fourier spectral analysis shows the existence of the following principal periods, 10.0, 11.0, 12.5 and 15.5 years. Their amplitudes in $^{14}C$ variation are 0.29%, 0.36%, 0.23% and 0.20%, respectively.

TEMPORAL-SPECTRAL ANALYSIS OF THE CHARACTERISTICS OF SOLAR ACTIVITY OVER THE PAST 400 YEARS

G E KOCHAROV and A N PERISTYKH

Physical-Technical Institute of the USSR Academy of Sciences, Leningrad 194021 USSR

The results of comparative temporal-spectral analysis of data on solar activity over the past 400 years are considered. The data used include the time series of the annual Wolf numbers, Aa-indices, borealis auroras and cosmogenic $^{14}C$, and $^{10}$Be abundance in tree rings and polar ice cores, respectively. We show that the Hale cycle, occurring during the Maunder minimum, was dominant.