

chemical composition of minerals was studied by energy dispersive spectrometry (EDS). In order to obtain clay fractions of $<2\ \mu\text{m}$ and $<0.2\ \mu\text{m}$ the samples were prepared according to the standard Jackson method. Clay minerals preparations were air-dried, glycol vapour saturated and heated at 330°C and 550°C .

Muscovite is the most common detrital mineral and the main component of the analyzed sediments. It occurs as mangled flakes, which underline the lamination of the host rocks. The EDS analyses have revealed fengite character of muscovites, which contain up to 5.27 wt% of the Fe_2O_3 . Biotite grains in most cases underwent chloritisation.

The XRD analyses of the $<2\ \mu\text{m}$ have revealed the presents of illite, chlorite and mixed-layer minerals: illite/smectite and chlorite/smectite. Illite, in most cases, is the component of cement. Detailed characterization of illite/smectite was based on the diffractograms of the $(0.2\ \mu\text{m})$ fraction obtain from the XRD studies of glycol vapour saturated oriented preparation. The type of layer ordering in the mixed layered minerals was established according to the position of 001 reflection. R1 and R >1 are the characteristic types of the ordering in these minerals. They contain up to 30% of smectitic component in their structure. The presence of 1M and 2M1 polytypes confirms the existence of both authigenic and detrital illite in the analysed clay material. The EDS investigation showed different amounts of Fe (from 5 to 30 wt% of Fe_2O_3) in illite or illite/smectite mixed layers.

It was determined that only detrital chlorites appear in the studied sediments. They are often products of chloritisation of biotite. The XRD studies of the $<2\ \mu\text{m}$ fraction displayed presence of chlorite and mixed-layer chlorite/smectite. It was confirmed during the EDS examinations, which revealed a considerable amount of K, which may derive from smectitic layers. Moreover, the EDS studies showed that chemical composition of chlorites varies considerably and that it is comparable to the composition of chamosite and ripidolite.

The chemical composition of minerals occurring in the studied rocks indicates the complex diagenetic environment. The composition of the pelitic fraction (illite, illite/smectite, chlorite and chlorite/smectite) and a small amount of smectitic component in the ordered illite/smectite interstratifications (R1 and R >1) in particular, indicate the advanced degree of diagenesis.

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Environmental impact of Pt, Pd, Rh and Au from catalytic converters along roadsides: The case of Attica, Greece

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Platinum (Pt), palladium (Pd), rhodium (Rh) and gold (Au) were investigated along high-ways of Attica, Greece, with varying traffic, like Katehaki, Messoghion, the intersection between Katehaki, Messoghion and Acharnon avenues, and residential roads, like Pindos and Navarinou roads. Platinum ranges between 110 and 960 ppb in dust samples and from 44 to 820 ppb in soils, Pd ranges between 90 and 1300 ppb in dust samples and from 36 to 1100 ppb in soils. The analysis of dust collected from parts of the roadsides closed to water sewerages reached as high as 2070 ppb Pt and 1980 ppb Pd contents. Gold ranges from 14 to 990 ppb Au (average 230) in dust samples and from 27 to 160 ppb Au (average 95) in soil ones. Any relationship between Au and Pt or Pd is not obvious. The significant fraction of the traffic-related emissions, reaching values over 4 ppm (Pt+Pd), suggest that they may be concentrated into local water systems resulting an environmental risk. Palladium was the most abundant PGE in the grasses ranging from 0.6 to 23 ppb (average 6.8 ppb), Pt ranges between 2.3 and 6.6 ppb (average 4.2 ppb) while Rh is < 0.1 ppb. Average values of the Pd/(Pd+Pt+Rh), Pt/(Pd+Pt+Rh) and Rh/Pd/(Pd+Pt+Rh) ratios decrease from 0.62 to 0.33 and 0.05 respectively, suggesting the Pd $>$ Pt $>$ Rh bioavailability order.