

Coal properties of the profile samples from the deltaic deposits of Oligo-Miocene age, Yeniköy-İstanbul, Thrace Basin (Turkey)

Çelik Y.¹, Karayigit A.I.² and Querol X.³

¹*Istanbul University, Department of Geological Engineering, 34320 Avcılar-İstanbul, Turkey, E.mail:yakup@istanbul.edu.tr*

²*Ahi Evran University, Vocation High School of Kaman, Kirsehir, Turkey*

³*Institute of Earth Sciences Jaume Almera, Consejo Superior de Investigaciones Cientificas, C/Lluís Solé i Sabarís s/n, 08028 Barcelona, Spain.*

The Yeniköy area in the Thrace Basin includes coal formations in deltaic deposits of Oligo-Miocene age. Coal-bearing deltaic deposits in this field have been evaluated in the Danişmen Formation and the lignite bed has been extensively exploited by open-cast methods. The lignite bed in the sampling point has a thickness of 7.80 m, and 9 profile samples were collected, from bottom to the top. The samples have been subjected to some analyses using standard methods. The coal samples, on an air-dried basis, average 11.02% moisture, 10.43% ash, 43.21% volatile matter, 35.34% fixed carbon, 1.93% total sulphur and 5221 kcal/kg net calorific value. The mineral matter of the selected coal samples that was identified by X-ray powder diffraction and SEM-EDX shows that the samples are mainly made up of clay minerals, quartz, and pyrite. The most abundant maceral group of the samples is huminite in which textinite, ulminite, and especially densinite are rich. Liptinite group macerals in all the samples, which are considerably higher than the inertinite group macerals. Elemental concentrations, which were determined by ICP-AES and ICP-MS, and Hg concentrations by Leco AMA254, have been evaluated in this study. The random reflectance values (%Rr, oil) of ulminite were measured in all the samples for the determination of coal rank, and the mean values of % Rr of ulminite indicate that the coal rank is of a lignite stage (soft brown coal).

Ground surface movements in the area of salt exploitation in Tuzla (Bosnia and Herzegovina)

Čeliković R.¹, Dervišević R.², Sijerčić I.³, Salihović R.⁴, Mancini F.⁵ and Stecchi F.⁶

¹*Faculty of Mining, Geology and Civil Engineering, University of Tuzla, 75000 Tuzla, Bosnia and Herzegovina, ruza.celikovic@untz.ba*

²*Faculty of Mining, Geology and Civil Engineering, University of Tuzla, 75000 Tuzla, Bosnia and Herzegovina rejhana.dervisevic@untz.ba*

³*Faculty of Mining, Geology and Civil Engineering, University of Tuzla, 75000 Tuzla, Bosnia and Herzegovina, indira.sijercic @untz.ba*

⁴*Municipality of Tuzla, 75000 Tuzla, Bosnia and Herzegovina, rule_s@hotmail.com*

⁵*Politecnico di Bari, Dipartimento di Architettura e Urbanistica, 70125 Bari, Italy, f.mancini@poliba.it*

⁶*CIRSA – Laboratori Scienze Ambientali, 48100 Ravenna, Italy, francesco.stecchi2@unibo.it*

This paper focuses on surface movements determined by geodetic methods and occurred as consequence of brine extraction from Tuzla salt deposit (Bosnia and Herzegovina). Previous studies were mainly concentrated on vertical movements, but important information about behavior of the deposit is also available from horizontal movement data. In the case of Tuzla salt deposit the geometry and spatial location of leached/empty spaces are unknown and the comparative analysis of vertical and horizontal movement could be really significant. The spatial identification of points with high values of vertical and horizontal movements depends on the geometry of empty spaces. Investigation of horizontal movements has been carried out analyzing data collected by several geodetic measurements. The results obtained by the correlated spatial analysis of vertical and horizontal movements, can identify basic geometric characteristics of the leached/empty spaces. The discussed temporal intervals are two characteristic periods, referred to the capacity of the deposit exploitation. Movement rates per year and correlation between horizontal and vertical movements are considered as indicator parameters defining the

character of ground deformation. Spatial analysis of these coefficients values has identified high risk areas, and gives additional information in the geological structures definition.

Power plants ashes recovery in eco-friendly mortar compositions

Cetean V.¹, Széll L.² and Ciornei N.¹

¹*Procema Geologi S.R.L., Preciziei street, No.6, RO-062203 Bucharest, Romania, procema.geologi@gmail.com*

²*Procema Cercetare S.R.L., Cluj-Napoca, Beiusului street, No. 1, RO-400394 Cluj county, Romania, procema.cluj@clicknet.ro*

The paper treats the possibilities to recover the waste from coal combustion in some power plants in Romania. The greenhouse gas and the ashes have a huge impact on environment and the living species. The using of ash – recovered wastes – induces decreasing of the demand of natural resources. They also reduce the energy - intensive production of other concrete ingredients, leading to energy saving and decreasing the “greenhouse gas” emission. Replacing one tone of cement with fly ash it would save enough electricity to power an average home for 24 days, and reduce carbon dioxide emissions equal to a two months use of an automobile.

During the study, in the experimental work were compared the properties of five different compositions of masonry mortars were prepared replacing the cement with different amounts of ash. The setting time and the workability were determined on the fresh mortar. After 28 days of hardening in standard conditions (5 days in moulds at 20°C and 90% humidity; 2 days without moulds at 20°C and 90% humidity; 21 days without moulds at 20°C and 65% humidity) the density and water absorption of the mortars were determined using the methods indicated in the European standards. The flexural and compressive strength of the compositions were determined after 28 and 56 days of hardening.

The fresh and hardened mortars characteristics were investigated. The compositions (cement, Zalau ash, sand and water, in different proportions) were prepared by forced mixing using a laboratory mixer. The fresh mortar was cast in metallic moulds obtaining 160x40x40 mm prisms which were subjected to testing in hardened state.

The study demonstrated that it is possible to use ashes in the mortar compositions, by replacing a part of the cement by ashes. The replacement of cement in proportion of 5, 10, 20 and 30 wt% was experimented. Thus, the setting times of the mortars increases. The difference between the initial setting time of the composition without ash and the composition in which 5 wt% of cement was replaced by ash is only 5 minutes. The differences are bigger for higher ash content; it reaches 80 minutes for composition 5 in which 30 wt% of cement was replaced by ash.

The differences are more evident in the case of the final time of setting, where replacement of 5 wt% cement lead to a 30 minutes longer final setting time and replacement of 30 wt% cement with ash a 310 minutes longer time, which means an increase of 1,5 times.

In the case of mortars workability no differences were observed between the composition with no ash and the composition in which 5 wt% of cement were replaced, after that every 10wt% of cement replaced by ash brings 5 minutes in plus.

The density increases slowly by replacing 5% of cement, after that a decrease is observed, every sample densities being under the density of the standard composition. The water absorption is in agreement with the results obtained for the densities. The water absorption decreases from 8.96 % (in the standard composition) to 8.34% (for composition 2 with 5wt% ash). For the other compositions the value of absorption increases to 12.87%, while the ash proportion was increased to 30 wt%.

The values for the mechanical strength state the observations at the density and absorption determination. For the composition with 5 wt% ash was observed an increasing of flexural and compressive strength. While the ash content was increased the mechanical strength decreased and it is situated below the standard composition strength. The mechanical test after 56 day of hardening shows that the strength increase is higher for the compositions with ash.