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Rybář J.	Interpretation of Data about Technogenic Activity at the Toe of Krušné, hory Mts. Affecting Endogeneous and Exogeneous Processes in the Rock Environment	9

Abstract

The analysis of long-term monitoring of Krušné Hory Mts. Slope deformations in the forefront of brown coal open pit ČSA mine has confirmed active tectonic movements, which are energetically controlled from the depth of the mountainous massif, and do not show direct correlation with the open pit mining. The massif appears under the action of a horizontal pressure with prevailing orientation to N-S. The effect of factors involved in the destabilization of side slopes in the pits has been determined. The most extensive landslide having volume of approx. 7 million m^3 and reaching 60 m of depth, has been moving since 1983, and reacted mainly to water saturation degree, which was related to precipitations, temperature and good functioning of the individual drainage systems. The effectivity of individual monitoring systems was classified for the two uneven rock zones that were covered: sedimentary of the basin and crystalline of the Krušné, Hory Mts. massif.

Doležalová M.	Problem-Oriented Constutive Modelling of Geomaterials	25

Abstract

This grant supported project was aimed at the elaboration of a method for the selection of an optimum, i.e. simple and physically correct constitutive model of geomaterials for the given type of geotechnical structures. The solution of the following partial projects has been assumed to this purpose:

- derivation of characteristic stress paths of typical geotechnical structures
- analysis of the effect of these paths on behavior of materials according to laboratory test results
- derivation of material properties and checking of the path effect by means of the inverse back analysis of measurement result in situ
- checking of constitutive models of geomaterials from the viewpoint of their ability to respect the characteristic stress paths

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Abstract
The requirements for energy saving, protection of the environment and ensuring all demands of the permanently increasing population all over the world need more and more utilization of the underground spaces. As a follow up of various kinds of construction activities (underground deposits of raw materials, fuels and waste, construction of the subway transport system and large-spaces garages etc.) there are growing requirements for the solution of the underground structures stability and the determination of the changes in the original state of stress in the rock mass. The knowledge of the construction state of stress is the elementary requirement during the judgement of its safety and it contributes to the optimization of the underground structures both from the structural and economic points of view and from the point of view of the environmental protection.

Balík K., Glogar P., Weishauptová Z.,Kolář F.,Jelínek R.	Manufacture and Properties of Carbon-Carbon Composites (CFRC)	45

Abstract
The aim of the project was the study of physical, predominantly mechanical properties and structure of fibrous carbon-carbon composites and on the basis of both newly and formerly acquired knowledge the suggestion of materials with high utility value in medicine or with higher resistance to oxidation.

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Abstract
Carbon matrix composite materials reinforced with carbon fibres have unique properties which make them suitable for demanding application in technique. Their outstanding biocompatibility together with appropriate porosity and flexural modulus suggest their utilization as bone replacements and other implants. The aim of this grant project was to manage the process of preparation of unidirectional carbon-carbon composites of and to reach with them mechanical and structural properties favorable for the considered utilization in medicine. In unidirectionally reinforced composites one cannot expect achieving the properties which are required e.g. for an implant or a construction part (these must usually contain a fabric reinforcement with a lower degree of strength anisotropy and elasticity). It is, however, possible to optimize with them the manufacture process and to study the influence of the type of the used carbon fibre, precursor of the matrix and the thermal processing of the composite on its resulting properties.

Weishauptová Z., Medek J.	Physical Principles of the Gas-Bearing and Gas-Yielding Capacity of Coal and Rocks	55

Abstract

During the years 1994 to 1996, the IRSM was engaged in the research project of the Grant agency of the Czech Republic No 105/94/1371, which dealt with the deposition of gas within the coal substance. Basing upon the differentiation of four bonding forms of gas, which can be released from coal, the partial and total potential gas-bearing capacity with corrections for water content and the stress condition of the rock massif have been determined. The correctness of the procedure was checked by comparison with the high-pressure sorption, where a very good agreement has been obtained. Due to the fact that the coalbed gas is a mixture of gases, mainly of methane and carbon dioxide, both the separate and mixed sorptions of these gases confirmed the assumption that CO_2 is adsorbed more readily that CH_4 . Potential gas-bearing capacity has been determined, at the same time, on rocks from both the hanging wall and bedrock.

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Abstract

The Study of the Influence of Polymeric Precursor Type and the Conditions for Preparation of Carbonaceous Membranes for their Sorption and Transport Properties. Changes in the properties of phenolformaldehyde resins during carbonization We have been studying the influence of preparation conditions on the properties of carbonizates (density, carbonization shrinkage, changes in elementary composition, sorption and permeation characteristics). The carbonizate was studied on the basis of sorption measurements. As adsorbate we used carbon dioxide and methane with the temperature of 20 °C. The time dependence was observed of the pressure in the adsorption vessel. On the basis of these measurements we calculated the mean radiuses of the pores, the surface of the micropores, microporosity and transport properties of the membranes. It was found that the properties of the carbonizates are influenced first of all by the final carbonization temperature. This dependence is described in enclosed articles. On the basis of time changes of the pressure in the sorption systém we can assume the rate of transport processes. The determination of permeation characteristics of microporous carbonaceous membranes was carried out in a flow cell of the Wicke Kallenbach type. For the measurement there were used microporous membranes and the identical membranes applied on the macroporous carrier from identical material, prepared on the workplace of the joint investigator. The investigator observed the density of diffusion flows and permeability in the systems of hydrogen-methane and hydrogen-ethane in dependence on the input composition of the gas mixture and on the temperature. The experimental data were evaluated by means of a mathematical model considering the activated diffusion in microporous substances. It was found that all observed membranes show high selectivity towards hydrogen, which is the highest in membranes with maximum carbonization temperature of 750 °C.

Kříbek B., Čejka J., Hilgard S., Šebestová E., Sobalík Z., Sýkorová I., Roják P., Strnad M., Boháček Z., Macurov H., Pašek J., Marek M., Eichler J., Pechanec V., Holý L., Borovec Z., Pavlíková H.	Weathering Rate of Fossil Organic Substance in Waste Dumps of Coal Mines and Large Construction Works and the Effect of Oxidation Products on Soil Properties of Dumping Grounds	83

Abstract

The weathering of the fossil organic substance is understood as a complex of processes involving the alteration of its chemical composition on the earth's surface. These changes are caused by several reasons, namely by the oxidation with the atmospheric oxygen. The term "low-temperature oxidation of organic matter" is used, in this connexion, for the description of the organic substance's reaction with oxygen at temperatures below 150 °C. It is well known that the reaction of coal with oxygen changes both the physical properties of organic substance (reflectance, fluorescence) and its chemical properties (alkali solubility, degree of aromaticity, quantity of pyrolysis products, (Landais et al., 1991). These reactions have mostly been studied in connexion with self-ignition of coal and changes of technological properties of coal substance (reduction of the caloric value of coal and reduction of pyrolytical products during the chemical decomposition of coal (Van Krevelen, 1981; Nelson, 1989; Pisupati and Scaroni, 1993).