

Purification of municipal wastewaters and production of odorless and cohesive zeo-sewage sludge, using Hellenic Natural Zeolite

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Treatment of municipal wastewaters (pH_{initial} 8.2-8.9) with 7.5 g of Hellenic Natural Zeolite (HENZA) of a grain-size < 1.5 mm, gave overflowed clear water of pH 7.3-7.8, free of odors and improved quality parameters by 89.9-96.7 % for the color, 89.0-98.5 % for the suspended particles, 93.7-97.2 % for the chemical oxygen demand (COD), 92.9-99.3 % for the P₂O₅ content and 98.3-99.9 % for the NH₄ content. The improvement of the quality parameters for the clear water increases with increasing stirring time of the treatment experiments. The correlation coefficient is 0.9423 for the P₂O₅ content, 0.9323 for the suspended particles, 0.9282 for the chemical oxygen demand (COD) and 0.8854 for the color. The correlation coefficient for the NH₄ content and pH are < 0.60. The HENZA comes from Ntrista stream of Petrota village of Trigono Municipality of Evros Prefecture, North-eastern Greece. HENZA contains 89 wt. % HEU-type zeolite and exhibit an ammonia ion exchange capacity (sorption ability) of 226 meq/100g. The mineralogical composition and the unique physico-chemical properties, make the HENZA suitable material for numerous environmental, industrial, agricultural and aquacultural applications, such as: animal nutrition, soil amendment for agriculture, pH soil regulation, greenhouse and flowers substrates, durability and health improvement of lawn, purification of industrial and municipal wastewaters, treatment of sewage sludge, odor control, fishery and fish breeding, gas purification and drying systems, oxygen enrichment of aquatic ecosystems, improvement of drinking water quality, constructed wetlands and wastewater treatment units. The treatment gave as precipitate odorless and cohesive zeo-sewage sludge, suitable for safe deposition and also for the reclamation of agricultural soils. The zeo-sewage sludge produced either from the municipal wastewater treatment or from the mixing of HENZA and sewage sludge, can be used for the reclamation of agricultural soils. The presence of HENZA in the agricultural soils, increases the crops yield by 17-66 % and improves the quality of agricultural products by 4-46 %, reduces the use of fertilizers by 56-100 %, reduces the usage of irrigation water by 33-67 %, prevents the seepage of dangerous species into the water environment (e.g., NO₃⁻ by 55-92 %), protecting thus the quality of surface and underground waters. The usage of HENZA in vivarium units and in the animal nutrition increases the production and improves the quality of the relevant products, reduces the feed cost, the animal diseases and medication, the new-born animal's death-rate and the malodor, converting thus the manure to odorless fertilizer.

Origin and deformation of the Thrace Basin: constraints from fault-slip analysis

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The origin and deformation style of the Thrace Basin, NW Turkey represent the target of ongoing debate. Uncertainties are partly due to imprecise knowledge of the stratigraphy of basin-fill sediments. In our contribution we report surface structural data including fault-slip analysis which are important for understanding the origin and structure of the Thrace Basin. Measurements were executed along the northern, north-eastern and south-western margin of the basin. The data from the SW margin also contribute to characterisation of the surface segment of the North Anatolian Fault between the Marmara and Aegean seas.