no earthquake takes place, because the fluids and gasses escape to the east and a sub-pressure is created in this space, and at the same time the crust is thin and the pressure the overlying oceanic water exerts on it is big, so the crust breaks and the space the pyrosphere would occupy causing an earthquake, is now occupied by water. Over this area, we notice a momentary drop of the water level, a sub-pressure in the atmosphere and descending air currents. Also, the contact of water with the exposed pyrosphere causes some of it to vaporize and a thick fog is formed locally. The time span of these phenomena is small, because the contact of the water with the pyrosphere causes the crack of the crust to reconnect quickly and calmness is restored.

Spatial and temporal variations in the geochemistry of suspended particulate matter in the shallow deltaic embayment of Northern Thermaikos Gulf, Greece

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The chemical composition of Suspended Particulate Matter (SPM) in the northern Thermaikos Gulf was studied during a six month experiment, carried out from June 2004 to November 2004. Water samples were collected from three different depths (1 m bellow sea-surface, 10 m depth, 2 m above sea-bottom) and filtered to obtain SPM elemental and Particulate Organic Carbon (POC) concentrations. The geochemical properties of SPM were determined by thin-film X-ray Fluorescence spectrometry.

SPM and POC concentrations exhibited strong spatial and temporal variations, related to the different environmental characteristics such as river discharge, wind/wave-induced resuspension of bottom sediment, biological productivity and anthropogenic interference.

Correlation analysis showed that the elements Al, Si, Fe, Ti, K, Mg, V and Ba, have terrigenous origin, i.e. detrital aluminosilicates minerals. Chromium, Ni and Co are of natural origin; they are derived from Axios and Aliakmon watersheds as mafic and ultramafic detrital material. Sulphur, Zn and Cu are derived from partly treated domestic and industrial effluents. The vertical distribution of POC implies higher biological activity at the upper layer of the water column. A part of Ca represents the autocthonous biogenic fraction i.e. biogenic carbonates. Phosphorus is mainly in the form of organic phosphate.

Synthesizing carbonates with added value for industrial use from the former industrial waste applying methodology of CO_2 mineral sequestration

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The sequestration (liquidation) of CO_2 is defined as catching, deposition and storing of CO_2. Industrial CO_2 can be deposited in the exhausted oil and gas deposits, in unexploitable coal seams or in the aquifers. Different methodology is represented by the binding of CO_2 in minerals (rocks) by the methodology of mineral sequestration (carbonatization). The first group of methods is accompanied with the risks of CO_2 deliberation during transport and deposition of CO_2. Moreover, the storage sites must be located away of the seismo-active zones and expensive monitoring is necessary during hundreds of years.

Some industrial wastes (e.g. fly ashes, slags) contain modified minerals or substances able to react with CO_2 with resulting its solid bonds in the lattice of newly formed carbon minerals - carbonates.

The main advantage of mineral sequestration of CO_2 by the carbonatization is the safe and fast (lasting only several hours) liquidation of gaseous CO_2, resulting in the origin of synthetic carbonates. They have no negative impact on the living environment, and, moreover, they can be used in industrial production.

Our pilot laboratory tests of CO_2 sequestration using laboratory high-pressure reactor were done on the samples of the fly ash and slags after the brown coal combustion and the crushed ultramafics (serpentinite) after the exploitation of chrysotile asbestos.

The X-ray analyses revealed in the primary samples of the fly ash and slags 92-100 % of the amorphous phase without the presence of carbonates. The serpentinite samples contained nearly 90 % of serpentinite minerals, only with subsidiary content of calcite. During the reaction of mechanically (fly ash, slags), resp. thermally (crushed ultramafics) activated compounds of the waste with gaseous CO_2 at precisely determined P-T conditions (0.1-0.9 MPa, 20-200 °C), the new mineral phases – acid carbonates and carbonates have precipitated in the relatively short time (2-22 hours) after carbonatization, filtration and following drying with crystallization.

The X-ray analyses confirmed the high quality of newly formed mineral phases – precipitated calcium carbonate (ca 100 % $CaCO_3$) with the calcite and aragonite minerals in the ratio 9:1, originating from the sample of fly ash, resp. 3:2 in the case of the sample of slags. The CO_2 sequestration using serpentinite has produced the high purity nesquehonite (97 %), resp. hydromagnesite (96 %). The new products have fine-grained to powdery composition of white to white-yellowish colours, which supports their application as inorganic fillings in industrial production of plastics, rubber, cements, paints, paper, etc.

According to the journal Industrial Minerals, in February 2010 the price of the ground calcium carbonate (GCC) reached 80-103 GBP/t, the price of precipitated calcium carbonate (PCC) 320-480 GBP/t, resp. elaborated precipitated calcium carbonate up to 550 GBP/t.

The application of the CO_2 sequestration by carbonatization in the industrial scale would result in the lowering of the amount of industrial CO_2 emitted into the air and deceleration of the global warming. It will simultaneously lead to minimization of the amount of stored waste material and to production of the economically interesting carbonates usable in manifold industrial branches. By this way the methodology directly as well as indirectly contributes to the protection of living environment. Presented research corresponds with the documents of the European Commission concerning the catching and liquidation of CO_2 with the need to lower CO_2 emissions by 20 % until 2020.

An approach to Sicilian underwater prehistory

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It is wise and necessary to say in advance that beside the well framed potential picture expressed by others, we don't have till now any real datum concerning any kind of prehistoric archaeological evidence so far found in the sea in central Mediterranean and, particularly, in Sicily if we exclude the famous cave of Cosquer not far from Marseille, some traces of Neolithic settlements in Roussillon and Grotta Verde in northern Sardinia. The evidences from Palinuro and Malta cannot be interpreted as real evidence of underwater prehistoric sites because they need further investigations.

Such consideration becomes more evident if we examine not the entire central Mediterranean region, but only the area around Sicily, between southern Italy and Aeolian islands, in the North, and Pantelleria, Lampedusa and Malta, in the South. Actually this topic of underwater prehistoric evidence of submerged settlements was widely faced in a mythological perspective. But this will be not my perspective because I will avoid to deal with the fascinating, but vague, question of the identification and position of Plato's Atlantis,