The impact on the environment of the phosphogypsum stacks in Romania

IANCU AURORA MARUTA[1], DELIA-GEORGETA DUMITRAS[1], STEFAN MARINCEA[1], CRISTINA SAVA[1]

[1] Geological Institute of Romania, Bucharest, Romania, 012271, e-mail: iancu.maruta@yahoo.com

Environmental issues such as water and soil pollution become important in everyday life. In Romania, huge stacks of phosphogypsum resulted from sulfuric leaching of raw phosphates are located at Valea Călugărească (56 ha), Turnu Măgurele (64 ha), Năvodari (48 ha) and Bacău (20 ha). The main factors with impact on the environment and on the recycling (reuse) of phosphogypsum deposits are the contents in radioactive and toxic (transitional) elements, the pore water acidity, the content in rare earths and the mineral impurities. Radioactivity measurements made on a set of soil samples taken near the phosphogypsum dumps at Turnu Magurele resulted in the following values: 0.37-4.24 U^{238} (ppm), 1.26-5.18 Th^{232} (ppm) and 0.0891-0.2046 K^{40} (%). Environmental problems can also be attributed to the mobility of some compounds from the phosphogypsum stacks (i.e., sulfates in solution, transitional metals- and REE-bearing compounds), as well as to the presence of Ra^{222} and the acidity of percolation waters that penetrate the soil. The contents of the U^{238} and Th^{232} isotopes in soil samples taken off from the contamined area in contact with the phosphogypsum stacks are lower than the similar contents in phosphogypsum. The acidity of the pore waters in the phosphogypsum stacks is higher than the acidity of the percolation water fixed in soils. Comparative values of transitional metals contents also show that the contents in Cd, Zn, Pb are higher in phosphogypsum than in the surrounding soil. The REE contents are not very important in the Romanian phosphogypsum, but they are much larger than in the surrounding soil.