

Is the cement an alternative for Phosphogypsum recycling?

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Regulations such as European Construction Directive (CPD) or Drinking Water Directive (DWD) contain provisions to exclude or minimize adverse effects on environment or public hygiene through the use of construction materials.

All building materials contain among other contaminants various amounts of natural radioactive nuclides. The purpose of setting controls in this kind of materials is to limit the radiation exposure and to avoid the riskiness that the presence of the existing hazards elements can produce to the human beings and the Environment.

The recycling in cement has become an alternative for eliminating certain kind of products (fuel, pollutants, phosphogypsum, etc.). These recycled products can be aggregated in new concrete, used as fill materials in road construction or for others purposes.

The development of environmental quality criteria and control procedures for cements and cementitious products is a need nowadays. Recently, European Union has developed standards that include the analytical techniques for determining the radioactivity index in raw materials for their use in construction. International Standardization Organization (ISO) has reviewed and implemented procedures for calculating the Radon exhalation rate from different materials including those used in building.

The key problems in using the cement as alternative for recycling the phosphogypsum mainly are: the content of hazardous elements as arsenic and natural radioactivity in the original raw material, the phosphogypsum acidity that comes from its treatment in the fertilizers factories and the material storage before recycling, avoiding the doses to the workers for the emanation of Radon. Some alternatives could be implemented to eliminate acidity, to reduce the toxic elements content, or to decrease the radioactivity in the cement. The concrete control tests should be improved for guaranteeing that in environmental conditions the radionuclides and hazardous elements could not be leached from it, having as a result the environmental contamination.