

# **Environmental impact of power plant disposal sites: a mathematical model waste**

## Summary

The study presents basic information on formation and properties of power plant wastes: ashes and slag. Chemical and phase composition of this refuse is discussed in light of its impact on environment. Several methods of ashes disposal are described, with special attention paid to dense water suspension – emulgate. Physico-chemical properties of the liquid emulgate, its solidification process and characteristics of resulting structure, are delineated.

A mathematical model of the body of solidified fly ash and its impact on environment was developed. It takes into account porous water flow, mass transfer driven by hydrodynamical dispersion and advection, equilibrium and irreversible chemical reactions occurring in the body. The model enables to assess the impact of chemical composition and physical properties of wastes on the most endangered element of the environment, i.e. groundwater. It facilitates prediction of both changes within the structure of the body itself, and environmental impact assessment, in even hundreds years' perspective. As an example of its application a model showing the impact of subsurface fly ash disposal site formed by dense water suspension method (emulgate) on groundwater has been presented.