

Abstract

The mass transport of contaminants in porous media is of great importance both in the field of research and in the applied field.

Today's respect for the environment and the safeguarding of resources has greatly increased the need to monitor and prevent environmental pollution.

Of great importance are the mathematical models that allow us to describe the concentration distribution in space and time of a pollutant in groundwater.

This research is focused on the study and modeling of pollutants in groundwater.

Bibliographic research and a subsequent in-depth study of 1D, 2D and 3D ADE models and their applications were conducted to examine the state of the art and possible areas for model development.

Emphasis was placed on the development of a new one-dimensional solution.

A variety of conditions were examined including the release of the source with step function, the decay of contaminants with consecutive reactions and the production and decay of the source concentration

From the one-dimensional model, it was possible to extend the model to three-dimensions with the exact integral solution and approximate solution in closed form.

A solution in approximate form was also obtained for a known solution in the Literature characterized by exponential decay at the source.

A comparative simulation analysis was performed on the models based on Literature data.