

Particular Application of a Mathematical Transport Model Incorporating Sub-Surface Reactive Pollutants

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A b s t r a c t

In the first part of the paper, a 2D transport equation was used, which takes into consideration only the non-linear adsorption term described by means of non-linear Freundlich isotherm. The equation of this type was the basis of numerical calculations of concentration for chosen indicators (nitrates and biochemical oxygen demand). In the second part, the presented equation took into consideration not only the non-linear adsorption term, but also the term of biodegradation (biological denitrification), described by the first-order microbial reaction, most often applied in practice. Numerical calculations in the first and second parts of the paper were carried out using the same numerical scheme and the author's program PCCS-2, presented in Aniszewski (2009) and compared afterwards with the measured concentration values. The calculation results made it possible to define the reduction degree of concentration reduction for the chosen chemicals as a result of reversible sorption and biodegradation processes.

Key words: aquifer, advection, dispersion, adsorption, biodegradation, nitrates, BOD indicator.