

# Preface

This tutorial presents the application of the open-source software *OpenGeoSys* (*OGS*) (Kolditz et al. 2012) with a geochemical solver *PHREEQC* (Palandri and Kharaka 2004) for hydrological simulations concerning reactive transport modeling. This tutorial is a result of the close cooperation within the *OGS* community ([www.opengeosys.org](http://www.opengeosys.org)), and these voluntary contributions are highly acknowledged.

The book contains general information regarding the reactive transport modeling and a step-by-step setup of models with *OGS* and *PHREEQC*, and related components such as *GINA\_OGS*, *ParaView*, and *Data Explorer*. Benchmark examples are presented in detail.

This book is intended primarily for graduate students and applied scientists who deal with reactive transport modeling. It is also a valuable source of information for professional geo-scientists wishing to advance their knowledge in numerical modeling of hydrological processes including reactive transport modeling.

This tutorial is the third in a series that will represent further applications of computational modeling in hydrological sciences.

- Computational Hydrology I: Groundwater flow modeling, Sachse et al. (2015), DOI [10.1007/978-3-319-13335-5](https://doi.org/10.1007/978-3-319-13335-5), <http://www.springer.com/de/book/9783319133348>
- Computational Hydrology II: Groundwater quality modeling, Sachse et al. (2017), DOI [10.1007/978-3-319-52809-0](https://doi.org/10.1007/978-3-319-52809-0), <http://www.springer.com/gp/book/9783319528083>
- Computational Hydrology III: OGS#IPhreeqc coupled reactive transport modeling, Jang et al. (2017, this volume)

These contributions are related to a similar publication series in the field of environmental and energy sciences:

- Geoenery Modeling I: Geothermal Processes in Fractured Porous Media, Böttcher et al. (2016), DOI [10.1007/978-3-319-31335-1](https://doi.org/10.1007/978-3-319-31335-1), <http://www.springer.com/de/book/9783319313337>

- Geoenergy Modeling II: Shallow Geothermal Systems, Shao et al. (2016), DOI [10.1007/978-3-319-45057-5](https://doi.org/10.1007/978-3-319-45057-5), <http://www.springer.com/de/book/9783319450551>
- Geoenergy Modeling III: Enhanced Geothermal Systems, Watanabe et al. (2016), DOI [10.1007/978-3-319-46581-4](https://doi.org/10.1007/978-3-319-46581-4), <http://www.springer.com/de/book/9783319465791>
- Geoenergy Modeling IV: Computational Geotechnics: Storage of Energy Carriers, Nagel et al. (2017), DOI [10.1007/978-3-319-56962-8](https://doi.org/10.1007/978-3-319-56962-8), <http://www.springer.com/gp/book/9783319569604>
- Geoenergy Modeling V: Models of Thermochemical Heat Storage, Lehmann et al. (2017\*)
- OGS Data Explorer, Rink et al. (2018\*),  
(\*publication time is approximated).

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- J.L. Palandri, Y.K. Kharaka, A compilation of rate parameters of watermineral interaction kinetics for application to geochemical modeling. Technical report, 2004

OpenGeoSys Tutorial

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