

Publication**Measured and modelled retention of inorganic sulfur in soils and subsoils
(Harz Mountains, Germany)****JournalArticle (Originalarbeit in einer wissenschaftlichen Zeitschrift)****ID** 86919**Author(s)** Lukewille, A; Malessa, V; Alewell, C**Author(s) at UniBasel** [Alewell, Christine](#) ;**Year** 1995**Title** Measured and modelled retention of inorganic sulfur in soils and subsoils (Harz Mountains, Germany)**Journal** Water, air and soil pollution**Volume** 85**Number** 2**Pages / Article-Number** 683-688**Keywords** sulfur sorption, long-term acidification, sulfate adsorption, hydroxosulfate minerals, modeling, future scenarios

Atmospheric deposition has resulted in an accumulation of inorganic sulfur (S) in many forest soils. At Sosemulde (Harz Mountains) samples from 5-240 cm depth were analysed. Most sulfate (SO₄) is accumulated at about 30-60 cm depth: 8.5-9.5 mmol(c) kg⁻¹. Large amounts can also be retained in >100 cm. To assess changes in SO₄ dynamics in time, adsorption isotherms have been included in several process-oriented models, e.g., in MAGIC. The Lange Bramke (LB) Model is the first model used on the catchment scale containing solubility products for the hydroxosulfate minerals jurbanite and alunite. By reconstructing the long-term acidification history (140 years) both models were successfully calibrated to a 14-year deposition, soil and streamwater data set at Lange Bramke catchment (Harz Mountains). According to MAGIC the present accumulation of SO₄ in 0 - 80 cm is 8.7 mmol(c) kg⁻¹, while according to the LB-Model 10.2 mmol(c) kg⁻¹ are stored as jurbanite. Both models predicted 4.5 mmol(c) kg(c) SO₄ in the subsoil layer, retained as alunite in the LB Model. These values correspond to the amounts measured in soil and subsoil samples at Sosemulde, respectively. However, for future scenarios with decreasing S inputs the models show different developments in SO₄ concentrations. Changes in MAGIC are gradual whereas the LB model predicts stepwise decreasing SO₄ values as soon as previously stored hydroxosulfates are fully dissolved. Such concentration "jumps" have not been observed.

Publisher Kluwer**ISSN/ISBN** 0049-6979**edoc-URL** <http://edoc.unibas.ch/dok/A5251190>**Full Text on edoc** No;**Digital Object Identifier DOI** 10.1007/BF00476908**ISI-Number** WOS:A1995UB05300066**Document type (ISI)** ArticleProceedings Paper