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SHALLOW GROUNDWATER HYDRO-CHEMICAL EVOLUTION AND SIMULATION WITH SPECIAL FOCUS ON GUANZHONG BASIN, CHINA

Wenke Wang^{1,2*}, Lei Duan^{1,2}, Xiaoting Yang^{1,2}, Hua Tian^{1,2}

¹School of Environmental Science and Engineering, Chang'an University, Xi'an 710054, P.R. China
²Key Laboratory of Subsurface Hydrology and Ecology in Arid Areas, Ministry of Education, P.R. China

Abstract

Groundwater hydrochemical evolution has influences on the rational use and conservation of water resources. This paper which takes MapGIS as the platform is aimed at demonstrating the evolution of shallow groundwater hydrochemistry in Guanzhong basin (China) by adopting mathematical statistics, ratios of ion pair equivalents, geochemical simulation. The direction of evolution is dependent on the geological, geomorphological, and hydrogeological conditions of the study area. The spatial distribution of hydro-chemical types, mineralization, hardness and ion content are horizontally zoned. In the areas both south and north of the Wei River and west of the Jing River, the shallow groundwater hydrochemical evolution is constrained by water - rock interactions. While in the north of the Wei River and east of the Jing River, the shallow groundwater hydrochemical evolution is relatively complex because of the evaporation-concentration process, mixed dilution and water-rock interactions. The causes of differences in water-rock interactions are mainly related to the relative dissolution/precipitation of calcite, dolomite, gypsum, fluorite and halite, the dissolution/escape of CO₂ and the positive ion exchange of Ca²⁺-Na⁺.

Key words: geochemical simulation, groundwater chemical evolution, Guanzhong basin, shallow groundwater

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* Author to whom all correspondence should be addressed: E-mail: wenkew@chd.edu.cn; Phone: +86 29 82339965; Fax: +86 29 85585485