GROUNDWATER CHEMISTRY RENDERING USING DUROV, PIPER AND ION BALANCE DIAGRAMS. STUDY CASE: THE NORTHERN PART OF SIBIU COUNTY

Maria-Alexandra HOAGHIA[1,2], Mariana PAUL[1], Cecilia ROMAN[1], Claudiu TANASELIA[1], Monica URSU[1], Dumitru RISTOIU[2]

[1]INCDO-INOE 2000, ICIA Cluj-Napoca, Donath Street, no. 67, 400293, Cluj-Napoca
[2]Babes Bolyai University, Faculty of Environmental Science and Engineering, Cluj-Napoca

Abstract

Chemical behaviors of groundwater are dynamic fields of research. Variations and changes of groundwater (water well) composition that is used as drinking water, impress negative effects on human health. The aim of this study is to determine and evaluate the chemical composition of ground waters (water wells) samples from the northern part of Sibiu County. Samples were analyzed using ion chromatograph instrument for the ion concentrations (NO2-, NO3-, SO42-, PO43-, Cl-), ICP-MS device, for metal concentration (Mg2+, Ca2+, K+ and Na+) and multi-parameter analyzer, for the physicochemical indicators (pH, conductivity, total dissolved solids-TDS). Data obtained were used for creating Piper, Durov and Ion Balance Diagrams using AqQa software. As results, high concentrations of ions and metals were found. The prominent type of water was Ca-Mg for Piper and Durov Diagrams and Ca-Mg-Na, Cl-SO42+ for the Ion Balance Diagram. High concentrations of nitrogen compounds, chlorides, cations and high value for conductivity of ground waters used as potable waters can present health risk.

Keywords: groundwater, ions, Durov Diagram, Piper Diagram.