

Eco-friendly and efficient monitoring of physico-chemical parameters of some mineral water from Slanic Moldova (Romania) during storage in different conditions – a case study

Lavinia MISAILA,^{1,2} Narcis BARSAN,¹ Dumitra RADUCANU,³ Luminita GROSU,¹
Oana-Irina PATRICIU*,¹ Irina-Claudia ALEXA,¹ and Adriana-Luminita FINARU*¹

¹Faculty of Engineering, "Vasile Alecsandri" University of Bacau, 156 Calea Marasesti, 600115 Bacau, Romania

²"Dimitrie Ghika" Technical College Comanesti, 1 Liceului Street, 605200 Comanesti, Romania

³Faculty of Science, "Vasile Alecsandri" University of Bacau, 156 Calea Marasesti, 600115 Bacau, Romania

Abstract. In this study, six natural mineral waters (from sources named Ibis, 5, 10, 14, 15, "Sonda 2") with therapeutic potential from Slanic Moldova area (Romania) were assessed for physico-chemical parameters during storage in different conditions (bottled in PET or glass containers and kept at 20-22 °C or 4 °C) for a period of maximum 360 days. The main parameters investigated were pH, conductivity, total dissolved solids, salinity, as well as the major ions (Na^+ , K^+ , Ca^{2+} , Mg^{2+} , F^- , Cl^- , SO_4^{2-} , HCO_3^-), using fast and environmentally friendly instrumental techniques (electrochemical and spectrometric / UV-Vis and ICP-MS). The physico-chemical indicators were measured at six time intervals (within 24 hours, after 7, 30, 90, 180 and 360 days) and the results obtained indicated that the pH variation was significant for the majority of samples kept at room temperature in PET containers (between 0.4 pH units - Spring 15 and over 2 pH units - springs 10, 14, Ibis and 5), while cold storage is most favorable for all natural mineral water samples. The monitoring of the chemical parameters determined during cold storage in glass containers did not reveal statistically significant variations and therefore it can be considered that these natural mineral waters are characterized by the stability of the chemical composition. For the entire analyzed period, the smallest variations of all twelve analyzed parameters were recorded for "Sonda 2", in all storage conditions, followed by springs Ibis, 15, 14, 10 and 5 stored at 4 °C in glass containers.

Keywords: natural mineral water; storage; electrochemical and spectrometric methods; quality indicators; statistical analysis.

* Corresponding author. E-mail addresses: oana.patriciu@ub.ro (Oana-Irina Patriciu); adrianaf@ub.ro (Adriana-Luminita Finaru)