

### Characterization of the main European mineral water brands based on the ion composition

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The history of the mineral water consumption goes back to early legends. Already then, in addition to physiological needs, their beneficial effects were also used in medicine. The composition of each mineral water varies according to its origin, the minerals, salts, gases and radioactive elements it contains and the quantities involved. Chemically, mineral water is a complex liquid.

In our research, statistical methods were used to analyze the chemical composition of the macro-parameters indicated on the labels of European bottled and commercial mineral waters. A total of 692 mineral waters from 13 countries were analyzed. Furthermore, mineral waters were classified according to their evaporation residue and ionic content. Correlation coefficients were used to study the relationship between the chemical composition of rocks and mineral waters.

Statistical analysis was carried out on the cations  $\text{Ca}^{2+}$ ,  $\text{Mg}^{2+}$ ,  $\text{Na}^+$ ,  $\text{K}^+$ , and on the anions  $\text{HCO}_3^-$ ,  $\text{Cl}^-$ ,  $\text{SO}_4^{2-}$ . Piper diagrams of the studied mineral waters were prepared by country, as well as box-plots and Spearman correlation and heat map analysis.