

## Analysis of Mineral Content in Bottled Mineral Water: A Brand-by-Brand Comparison

Nurfaridah Zulaikha & Rossuriati Dol Hamid\*

### Structured Abstract

**Background:** Water is essential for human health and with growing concerns about the safety of drinking water, bottled mineral water has become increasingly popular in Malaysia. The increase in sales of bottled mineral water has caused the emergence of a lot of brands in the mineral water industry. This study focuses on four minerals found in bottled mineral water, sodium (Na), potassium (K), magnesium (Mg) and calcium (Ca), as measured by Inductively Coupled Plasma-Atomic Emission Spectroscopy (ICP-AES) and Flame Atomic Absorption Spectroscopy (FAAS).

**Methods:** Na and K were quantified using ICP-AES while Mg and Ca were measured using FAAS. Series of standard mixture of Na and K were prepared for calibration in ICP-AES as the instrument allows for simultaneous detection while a separate series of Mg and Ca were prepared for calibration in FAAS. Since the sample is a simple mineral water, no further digestion method is required. 100mL of nitric acid were added to the sample to stabilize the analytes. Lastly, the samples were diluted until target element falls in the range of the series of standards prepared.

**Results:** Calibration curve of the four elements showed a good  $R^2$  value of greater than 0.900 in which Na has a value of 0.9974, K has a value of 0.9873, Mg has a value of 0.9146 and Ca has a value of 0.9972. The sample were then quantified using the equation of the calibration curve obtained. The study of the relationship between concentration of elements in mineral water and price were conducted using Pearson correlation and linear regression. The results of Pearson correlation showed a strong positive association between price and the concentration of Mg and Ca but negative correlation for Na and K. Linear regression analysis assessed that only concentration of Mg and Ca has statistically significant relationship with price ( $p < 0.05$ ), suggesting that higher-priced mineral water tends to contain more of the elements.

**Conclusion:** To conclude, this study manages to identify that the relationship between price and concentration of element only exist for Ca and Mg, while the concentration of Na and K is not affected by the price of the water.

**Keywords:** Mineral water, Sodium, Potassium, Magnesium, Calcium

\*Correspondence: [rossuriati2996@uitm.edu.my](mailto:rossuriati2996@uitm.edu.my)

<sup>a</sup> School of Chemistry & Environment, Faculty of Applied Sciences, Universiti Teknologi MARA, Shah Alam, Malaysia