DETERMINATION OF ANTIMONY IN NATURAL MINERAL BOTTLED WATER

Katarina Jovanović, Milica Milenković, Margarita Dodevska, Zorica Blagojević, Marija Ignjatović, Olgica Mandić

Institute of Public Health of Serbia Dr Milan Jovanović Batut, Belgrade, Serbia

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Objectives: Antimony (Sb) is semimetallic chemical element which occurs naturally as sulphide ore, stibnite and valentinite. Human can be exposed to antimony by drinking water, food and soil contact. Polyethylene terephthalate (PET) is a thermoplastic polymer widely used in synthetic fibre, films and bottles. PET is the most popular material for food and beverage packaging. Antimony trioxide (Sb_2O_3), together with antimony acetate and antimony glycolate, is the most frequently used catalyst in the production of PET resin and antimony remains in the produced objects. Drinking water that contains high levels of antimony may affect the liver and gastrointestinal system. Other health effects that have been reported include kidney, cardiovascular, metabolic, and developmental effects.

Methods: Thirty-two samples of bottled water from the market of Republic of Serbia were collected and analysed. Determination of antimony in bottled water samples is done using US EPA method 200.8: "Determination of Trace Elements in Waters and Wastes by Inductively Coupled Plasma - Mass Spectrometry (ICP-MS)." Validation parameters: limit of quantification (LOQ): 0.0004 mg/L, scope of the method: 0.0004 - 0.05 mg/L and measurement uncertainty: 10%

Results: Thirty-two samples of bottled water were collected and analysed. The results ranged from LOQ to 0.004 mg/L. The results of 6 (18.75%) samples were higher than LOQ but below maximum acceptable concentration (MAC). The water quality control is performed according to the valid book of rules on hygienic accuracy of drinking water. MAC for antimony in natural mineral bottled water is 0.005 mg/L.

Conclusion: From the obtained results, it can be seen that all results are below maximum acceptable concentration which indicates that water is healthy and meets the current legal regulations"

Keywords: drinking water, antimony, bottled water, ICP-MS