Introduction

The analysis of selenite, arsenate, selenate, tungstate, and molybdate is simple and accurate using suppressor-based ion chromatography. Interests in selenate, arsenate, selenite, tungstate, and molybdate in biological and environmental samples have increased the importance of quantitative analysis of these anionic species. Selenate can be found in alkaline soils of regions with low rainfall\(^1\). Mineral weathering of igneous and sedimentary rocks allows arsenate to dissolve in water and to leach into soil\(^2\). Tungstate enters the water and soil via dust produced during purification of ores used in the production of alloy steels\(^3\). Molybdate, which is essential for enzyme functioning in plants, is important in agriculture\(^4\). The determination of these anionic species is important because of their biological effects on the environment.

Although selenite, arsenate, selenate, tungstate, and molybdate can be analyzed using single-column ion chromatography (SCIC)\(^{(1,2,3,4)}\), suppressor-based ion chromatography provides a higher signal-to-noise ratio, thus improving the analyte signal over SCIC. The Alltech ERIS 1000HP Autosuppressor is an electrochemically self-regenerating solid-phase suppressor, designed to improve the detection sensitivity and baseline stability when anions are analyzed. The ERIS 1000HP converts high conductivity mobile phase into low conducting or non-conducting species, and low conducting analyte anions into high conducting acids\(^5\). The Allsep Anion Column packed with methacrylate based anion exchanger is used to separate selenite, arsenate, selenate, tungstate, and molybdate. For more information on the Alltech Allsep Anion Exchange Column, request Data Sheet #U51214.

Results and Discussion

Separation of selenite, arsenate, selenate, tungstate, molybdate and the seven common inorganic anions on the Allsep Anion Column using suppressor based ion chromatography is shown in Figure 1. The retention times of selenite, arsenate, selenate, tungstate, molybdate, or the seven common inorganic anions can be decreased by using a shorter column or by increasing the concentrations of sodium bicarbonate and sodium carbonate.

Conclusion

Analysis of selenite, arsenate, selenate, tungstate, and molybdate is simple and accurate using ion chromatography. Alltech Allsep Anion Column with suppressed conductivity detection can be used for quantitative analyses of these anionic species.

References:
\(^1\) U. Karlson and W.T. Frankenberger, Jr., J. of Chromatogr., 368 (1986) 153-161

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