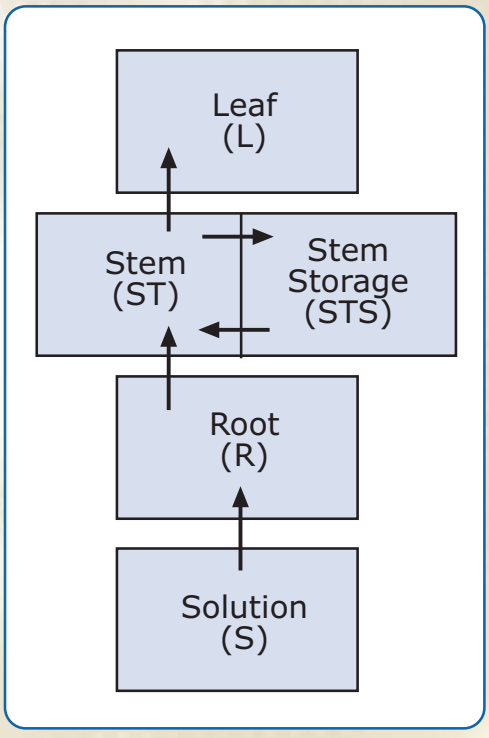
acslXtreme®

Case Study: Phytoremediation Modeling

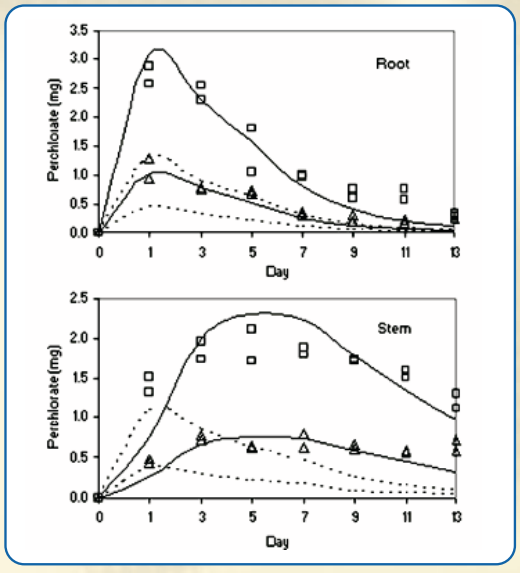
Inorganic contaminants that accumulate in the soil and ground and surface waters as a result of industrialization can prove hazardous to human health. If uncontrolled, the contaminants can result in general fatigue, malaise, or a detrimental genetic mutation in humans.

The EPA controls and regulates known and potential contaminants. The return of the ecological system to a normal balance is achieved through a number of methods including phytoremediation, a process in which plants accumulate a contaminant from soil and water and are then harvested at an appropriated time thereby removing the potential for accumulation in drinking water and food sources.



In a recent publication, Sundberg et al. utilize acslXtreme to develop a predictive, kinetic model for tobacco plants used in phytoremediation. acslXtreme provides a method to quickly and accurately create a mathematical model for accumulation of perchlorate based on properties of both the contaminating chemical and the anatomical and physiological properties of the plant.

Upon validating the model, Sundberg et al. have imported actual data into acslXtreme from tobacco plants that have accumulated perchlorate and quickly generate 2D graphs that depict the predictive (lines) and actual accumulation (geometric shapes) data. The graphs show the accuracy of acslXtreme in predicting perchlorate accumulation and facilitate determination of optimal plant harvest for phytoremediation.



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Work Cited

Sundberg SE, Ellington JJ, Evans JJ, Keys DA, Fisher JW. University of Georgia. Accumulation of perchlorate in tobacco plants: development of a plant kinetic model. J. Environ. Monit. 5, 2003; 505-512.

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