

Interactive comment on “Quantification of toxic metallic elements using machine learning techniques and spark emission spectroscopy” by Seyyed Ali Davari and Anthony S. Wexler

Anonymous Referee #1

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My major concern is that quantification of deposited samples on the electrode should be difficult. The accurate known amount of deposited mass will guarantee the improvement of quantitative performance of the spark system. How to control the mass of deposited elements on a 1 mm diameter tungsten ground electrode of the spark system for emission analysis? The use of a micropipette was sufficient to control the mass of certain element on the electrode?

Is this spark system applicable for the ambient PM samples, which should be their target in the future as stated in introduction? The airborne particle deposition on the electrode would be totally different from current configuration where the solution was

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deposited with the use of micropipette.

Most of contents in this paper were related to machine learning process for analysis of emission spectra, not much about aerosol measurement systems. In my view, it might be more appropriate to submit this study to machine learning or AI journals.

Minor things

More detailed schematics for experimental setup should be useful. Figures 1 and 3 would be moved to supplementary materials.

“For each element, 0.1, 1, 10 and 100 ng of mass were deposited on the ground electrode. For each concentration, 10 spectra were collected using 2 μ g delay between the observed and recorded emissions.” How to obtain the mass here? More explanation is required here. The delay time unit would be us, not ug.

Any effect of delay time control on the emission spectra?

More explanation on the spark energy? Can you guess plasma temperature? How stable the spark energy? You may discuss this with laser induced plasma system

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