Review of: "Flame Photometry: For the Determination of Alkali Metals in Commercially Sold Fireworks"

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Potential competing interests: No potential competing interests to declare.

The article is devoted to the determination of potassium and sodium in pyrotechnic products. To solve the problem, the authors expectedly chose the method of flame atomic absorption spectrometry. In the work, the authors assessed the effect of additives of various substances and anions on the analytical signals of potassium and sodium. In general, the authors solved the problem. There are several points worth considering in future studies.

1. The authors did not indicate the composition of the gas mixture to produce the flame or the wavelength at which potassium and sodium were determined. It is also not indicated whether any buffers (additives to the solution to obtain correct results) were used.

2. Too many numbers are given for the calculated detection limits; the standard deviation must be taken into account. Also, in the obtained analysis results, it is necessary to reduce the number of numerals, for example, $671 \pm 2*8\%$ is 671 ± 107, i.e., $(6.7+1.1) \cdot 10^2$.

3. It is not clear how the standard deviation is calculated. How many portions of one sample were analyzed to obtain the error (and what mass of the sample was dissolved)?

4. Calibration graphs are plotted in the range of 10-1000 mg/l, and in Figures 3 and 4, the range up to 3000-4000 mg/l is studied. It is obvious that in the region of high concentrations, the linearity of the graph will not be preserved due to other reasons (self-absorption, sensitivity of the device..), and not the matrix influences that were studied.

5. Having determined the content of sodium and potassium, the authors approximate the results for sodium and potassium nitrates, although anions were not determined. In this, they can be helped by both ion-selective electrodes or capillary zone electrophoresis, which can also determine metal cations.

6. It is also worth checking the accuracy of the analysis by comparing it with the results of another method or the spiking method, or by analyzing solutions with different dilutions. When studying barium in the future, it is worth paying attention to dissolution, because not all barium salts are soluble in water.