

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.

Abstract:

- In general, Na, K, Ba, and Sr are used as oxidizers; however, no studies of the alkali earth metals are presented in this work.
- Potassium has higher relevance as the associated nitrate is used more widely than sodium. So why was sodium examined instead of focusing on the nitrates of barium and strontium?
- The abstract contains the statement of the standard deviation of the flame photometry analysis of the elements. These deviations relate only to samples below 50% presence of nitrates. Were higher concentrations also measured? Please state for the standards.

Introduction:

- The introduction is generally very long and can be shortened considerably. Many sentences are superfluous or have similar statements.
- The section on festivals can be significantly shortened. It is not necessary to list the festivities. The last part of this paragraph still needs a reference.
- The beginning of the following section is common knowledge.
- In the section, it is described that potassium nitrates and sodium nitrates have similar physical and chemical properties. The next sentence states that sodium nitrate is hygroscopic. This should be rewritten.
- The performance of potassium nitrate is then listed again, which has already been mentioned previously.
- The following large table shows various methods for determining potassium and sodium. However, this is not necessary. A more detailed explanation of flame photometry would suffice. This only unnecessarily lengthens the introduction.

Materials and Methods:

- Commercial firecrackers were used for the materials. Do the firecrackers use the same basic chemicals as specified here?
- The device parameters cannot be found in the text. How large is the detectable range of the device?
- Why were firecrackers with an unknown amount of sodium and potassium used? Were the mixing ratios not clarified beforehand during production?

- The incubation period of the test series varies. Is there a special reason for this?
- The dilution must also be specified for reproduction of the experiments. It can therefore be assumed that the concentration is significantly higher than the specified measured values.

Results and Discussion:

- The R^2 value of the standard line of potassium is relatively poor.
- There is no explanation of the factors in formulas (4) and (5). The values 3.3 and 10 should be explained. This would make it easier for the reader to understand.
- Based on the different nitrates, are these compositions based on a starting formulation? Please specify.
- A reverse calculation for the commercial firecrackers was only made for sodium. A percentage for potassium would also have been desirable.

Conclusion:

- The summary is written very vaguely and can go into more detail about the results of this work.
- A list of the topics currently being processed is not to be included in this document.

References:

- The selected references provide a good basis for the work. The presentation of the references in the text could be improved.

Overall, it can be said that this work is interesting. However, several points in this work still need to be improved and submitted in order to clarify the work.