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.

This work describes a method for the determination of sodium and potassium in firecrackers, using flame spectroscopy. The topic could be of some interest, mainly as an analytical method. However, at the moment, it has many issues I would recommend improving.

Grammar and phrasing issues: There are grammar and phrasing issues throughout the paper. A few examples:

"during the festive celebration" should be "during festive celebrations," as you are not talking about a specific celebration

Headaches seems more appropriate than headache.

"Fireworks and firecrackers are also part of various festivals" – this should not be presented as "also," but as examples of the celebrations mentioned in the previous sentence.

Lakhs – it might be better to change this to a phrase more globally well-known.

"Fireworks are mainly consisting" - Fireworks mainly consist of

"charcoal or sulphur or aluminium" – charcoal, sulphur, or aluminium

Other issues:

1. I would separate the natural and anthropogenic causes of pollution. At the moment, it seems like volcanoes are part of the anthropogenic causes.
2. "Recently, there has been a consistent change in the composition of firecrackers to reduce the environmental consequences" – This statement warrants a reference.
3. "The latter is then used as an oxidiser in fireworks manufacturing." – This repeats the explanation about KNO_3 that was just given earlier in the same paragraph.
4. Are the emissions from firecrackers really so large that they are really likely to increase the sodium and potassium of nearby people to values that would risk them? I would like to see a reference or calculation to support this claim.
5. The comparison to other methods has some issues as well: ISE has issues with higher concentrations, but so does flame spectroscopy, and, as you mention, that issue is simply solved by dilution of the sample.
6. XRF is not very sensitive towards sodium, which is a disadvantage worth mentioning.
7. Ref 22, which is meant to represent Na/K quantification by ICP, is a paper about flame photometry.

8. The use of acid for ICP is strange to claim as a disadvantage, as most of those methods require dissolved samples. The presented work dissolves the analytes in water, which ICP can run as well..
9. I think you don't need to try and present it as if flame spectroscopy is better than the other mentioned techniques. Like every technique, it has upsides and downsides.
10. Why not add a few general references, such as a review, on flame spectroscopy?
11. "It detects metal ions based on their characteristic emission light, and hence the presence of other metal salt doesn't create much more interference" – the reference is for ICP-AES, which also uses emission, but is a different technique. More importantly, metals such as sodium affect the flame, and therefore can cause interferences (for example, see " The flame photometric determination of sodium, potassium and calcium in plant extracts with special reference to interference effects, Analytica Chimica Acta, 1961)
12. What is the weight of the firecracker used as samples? When different amounts are measured, is the same result obtained?
13. The instrument parameters aren't disclosed.
14. You assume that the potassium and sodium measured only originate in their nitrate salts; are you certain?
15. You present two standard sets. For the low concentration set, the concentrations are presented from lowest to highest, and for the high concentration set, it is the opposite.
16. The LOD determination method should have a reference. Also, you obtain an LOD value of 3.26 ppm for potassium, but nearly all of your standard set falls below that value.. Also, the measurement seems to still give a linear response at the values below this LOD value, which suggests it might not be the actual LOD.
17. You measure known concentrations of the metal in the presence of other metals, but don't measure them without the other metals. Without that comparison, it's hard to say if the additional metals had an effect on the obtained results.
18. If you are presenting a new analytical method, you should examine its robustness and calculate its uncertainty.
19. The method was not validated. You need to either use firecrackers of known sodium and potassium concentrations, or to measure the same samples using an established technique. As presented, there is no support to the claim that the obtained results are the actual concentration in the firecrackers.

I think once these comments, along with the suggestions of other reviewers, are addressed, the manuscript would be greatly improved.