Photograph



Title of the Abstract: **Rapid and greener methods for extraction of halogens in fossil-fuel samples prior to spectrometric and chromatographic detection**

Nomvano Mketo
College of Science, Engineering and Technology, Department of Chemistry, Florida Science Campus, University of South Africa, Roodepoort 1710, Johannesburg, South Africa
University of South Africa
South Africa
Novel sample preparation techniques, Track 2-1
(Oral presentation / Poster presentation)

Open Rubric

Abstract:

Halogens are commonly detrimental when present in fossil fuels as they have negative impacts, including corrosion, catalyst poisoning during processing and environmental pollution. Therefore, spectrometric [1] and chromatographic [2] techniques are the promising detection techniques and well reported for quantification of halogens in various matrices. Although, ICP-OES/MS are proven to provide multi-elemental capabilities and good sensibilities, target analytes are predisposed to numerous spectral, isobaric and polyatomic interferences; mainly due to concentrated inorganic acids traditionally used during microwave digestion procedures of the solid matrices.[3] Additionally, the utilization of concentrated acids during microwave digestion methods hinders the detection of halogens by ion-chromatography, due to interferences that are caused by the anions of the acids. [4] Therefore, the current study reports the usage of hydrogen peroxide for rapid microwave digestion of energy recourses prior to halogen detection suing spectrometric and chromatographic techniques. The halogen concentration levels from the microwave digestion method have shown consistent agreement (%R $\geq$ 80) with certified concentration values of the CRMs. This correlation, in addition to the good precision (RSD $\leq$ 5%) achieved by the proposed procedure, recommends that the extraction procedure is reliable, accurate and reproducible. Therefore, the proposed microwave procedure can be applied in routine laboratories for the determination of halogens in fossil-fuels and related matrices.

References

1. de Gois et al., Analytica Chimica Acta, 852 (2014) 82-87.
2. Robaina et al., Journal of Chromatography A, 1458 (2016) 112-117.
3. Mketo et al., TRAC., 85 (2016) 107-116
4. Mketo et al., RSC Adv., 5 (2015) 38931-38938.

Biography:

Dr. Mketo is a lecturer of analytical chemistry in University of South Africa and also involved in the supervision of postgraduate students. She graduated her B.Sc. (Distinction) and B.Sc., Hons (Cum Laude) Chemistry degrees from University of the Western Cape in 2007 and 2008, respectively. Dr. Mketo obtained her M.Sc. degree, received TATA merit award from Stellenbosch University in 2010. One accredited journal article was produced from the M.Sc. project. In July 2012, she then enrolled her PhD under Professor Ngila and 10 accredited journal articles were published. In 2015, she received L'Oréal-UNESCO for Women in Science Sub-Sahara Africa award.

Research Interests:

- Microwave, ultrasonic and combustion based sample preparation methods for extraction of multi-element from food, biological and environmental samples prior to their spectrometric determination.
- Development of extraction induced by emulsion breaking procedures for extraction of trace-elements in various oils, lubricants and fuels.
- Fabrication of nanocomposite for elemental pre-concentration, gas sensor and flue-gas desulphurization.

Mail Id:nomvano.mketo@gmail.com or mketon@unisa.ac.za

Contact Number: Tel: +27 11 471 2032
Cell: +27 71 739 4436
Twitter account: n/a
Linked In account: n/a
Facebook account: n/a
Suggestions of colleagues/Professors/scholars to send invitation (if any):n/a

Suggestions of Sessions in the conference (if any):n/a