

**Ministry of Education
Department of Higher Education
Yangon University of Distance Education**

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Research Journal**

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Measurement of Element Contained in Cigarette and Cigar Samples by Using X-ray Spectroscopy

Thi Thi Win¹, Myo Nandar Mon², Moh Moh³

Abstract

Cigarettes and cigar samples collected from consumer shops in Yangon were quantitatively analyzed by using the SHIMADZU EDX-700 EDXRF SPECTROMETER. According to the measurements of the elemental concentrations the toxic and harmful element of the samples were observed.

Introduction

Major hazards of tobacco use, however, involve carcinogenic compounds in tobacco and tobacco smoke. Many jurisdictions have enacted smoking bans in an effort to minimize possible damage to public health caused by tobacco smoking. Tobacco plants contain high concentrations of a natural radioactive material. This substance remains on the tobacco during the manufacture of cigarettes. The proof is that it can be found in the blood and urine of smokers. The circulating polonium-210 causes genetic damage and early death from diseases reminisced of early radiological pioneers: liver and bladder cancers, stomach ulcers, leukemia, cirrhosis of liver and cardiovascular diseases. Because of including the poisonous and toxic elements in tobacco there was needed to find out the major and trace element essentially. The objective of this research work is to find out the radioactive elements and harmful elements of the thirteen cigarettes and two cigars. To find out the elements contained in the were analyzed by using energy dispersive x-ray fluorescence spectrometer Shimadzu EDX -700 as shown in Figure 1.

Sample collection

In the present work, the samples were collected from retail center shops, consumer level in Yangon as shown in Table 1.

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Table 1. Sample number and sample name of the different kinds of the cigarette and cigar

Sample No	Sample name
T 1	Fine cigarette
T 2	Vegas cigarette
T 3	London cigarette
T 4	Freel cigarette
T 5	Export cigarette
T 6	Euro cigarette
T 7	Paris cigarette
T 8	Pollux cigarette
T 9	Mount Popa cigarette
T 10	Duya Green cigarette
T 11	Ruby cigar
T 12	Shwe Nagar cigar
T 13	Sein Yadanar cigar



Figure 1 The photo of Energy Dispersive X-ray Fluorescence Spectrometer (Shimadzu EDX-700 Spectrometer)

SHIMADZU EDX-700 EDXRF Spectrometer

The present work was performed at Universities' Research Center (URC), Yangon University. The EDXRF spectrometer used throughout this investigation is a computer-controlled SHIMADZU EDX -700 (Japan) spectrometer. This spectrometer system is a compact high performance analyzer and permits simultaneous spectroscopic analysis of elements ranging from light elements to heavy elements (ie. Na ($Z = 11$) to U ($Z = 92$)) and in concentration ranging a few parts -per-million (the ppm range) to 100%. The SHIMADZU EDX - 700 (Japan) spectrometer has a number of advantages.

Experimental Work

The dry samples were ground into fine powder by using grinding machine. And the powder was poured into a die, made of steel and pressed into pellet in 4 tons weight of press, SPECAC Cambridge Electric Industries. The diameter of pellet was 2.5cm. The sample preparation was performed in URC.

In present work, the sample pellets were placed in the sample chamber of EDX-700 spectrometer which can measure sixteen samples at a time. A large sample chamber with an automatic opening and closing door was used. After closing the door the chamber was pumped up to vacuum. The pressure was room pressure and the detector temperature is about (-17°C), the EDX-700 was put into operation. Each sample was run for about 100seconds and the spectra were analyzed in IBM/PC using EDX-700 software. The Fundamental Parameter or FP method of analysis is an important analysis method. Based on this, the EDX-700 is provided with high performance FP software as standard.

Measurement Conditions of Shimadzu EDX 700 System

Sample	cigarettes and cigar samples
Sample type	powder (Pellets)
Instrument	Shimadzu EDX-700 Spectrometer
Atmosphere	Air
Collimator	10 mm
Spin	Off
Target	Rh
X-ray tube voltage	50 kV
Current	20 μ A
Acquire energy range	0-40 k eV
Analyte energy range	0-40 k eV
Real time	98-99-100 sec
Dead time	23 – 26 %
Analyte	Si-U

Table 2a. Elemental concentrations in thirteen cigarettes and cigar samples

Element Sample	Ca	K	Fe	S	Cl	Sr
T 1	59.133	23.424	6.979	4.055	3.561	1.232
T 2	47.578	37.591	2.086	2.791	6.796	0.76
T 3	46.981	37.834	3.389	3.019	5.413	0.807
T 4	50.259	37.077	3.068	5.744	ND	0.589
T 5	58.945	20.239	4.9	2.769	10.818	1.152
T 6	58.124	29.528	3.731	5.42	ND	0.633
T 7	58.567	29.505	3.33	5.145	ND	0.646
T 8	54.857	33.506	3.534	3.678	ND	0.483
T 9	58.812	18.967	5.351	3.75	9.606	1.146
T 10	52.754	25.458	4.044	2.976	12.289	0.973
T 11	49.913	31.916	9.667	3.492	ND	1.126
T 12	52.484	28.048	7.077	3.634	3.092	1.107
T 13	54.737	30.599	7.206	3.236	ND	1.147

ND= No Detection

Table 2b Elemental concentrations in thirteen cigarettes and cigar samples

Element Sample	Mn	Cu	Zn	Br	Rb	Ti
T 1	0.62	0.519	0.478	ND	ND	ND
T 2	1.161	0.34	0.328	0.318	0.25	ND
T 3	0.993	0.403	0.311	0.568	0.281	ND
T 4	0.962	0.435	0.433	1.088	0.345	ND
T 5	ND	0.456	0.418	0.303	ND	ND
T 6	1.505	0.502	0.556	ND	ND	ND
T 7	1.628	0.466	0.458	0.256	ND	ND
T 8	1.345	0.458	0.486	1.213	0.441	ND
T 9	0.657	0.454	0.481	0.419	0.356	ND
T 10	0.519	0.369	0.322	ND	0.297	ND
T 11	0.853	0.615	0.607	ND	0.528	1.283
T 12	1.346	0.447	0.65	0.315	0.672	1.128
T 13	1.488	0.382	0.476	ND	ND	0.729

ND= No Detection

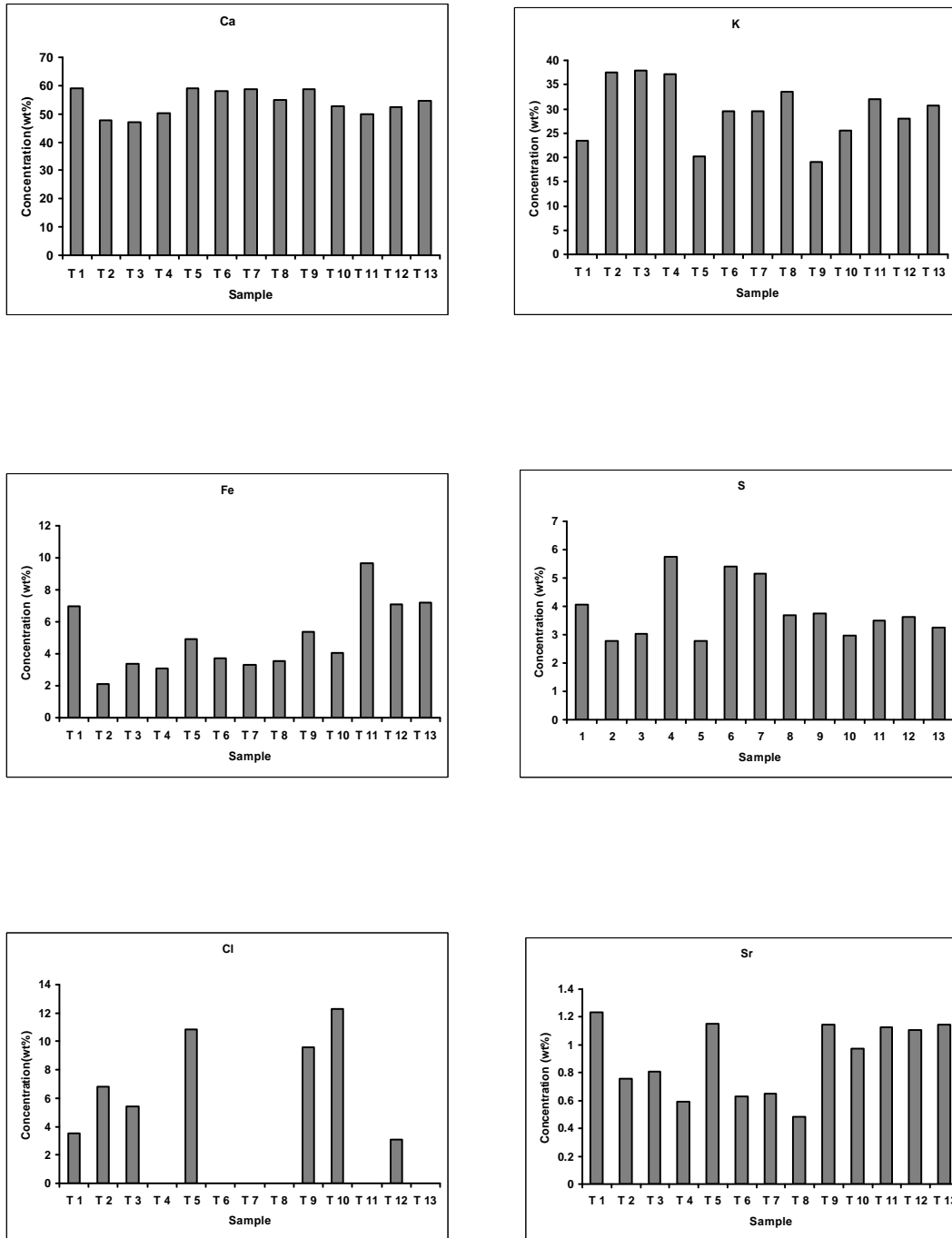


Figure 3 The graphs of calcium (Ca), potassium (K), iron (Fe), Sulphur (S), chlorine (Cl) and Strontium (Sr) concentration of the samples

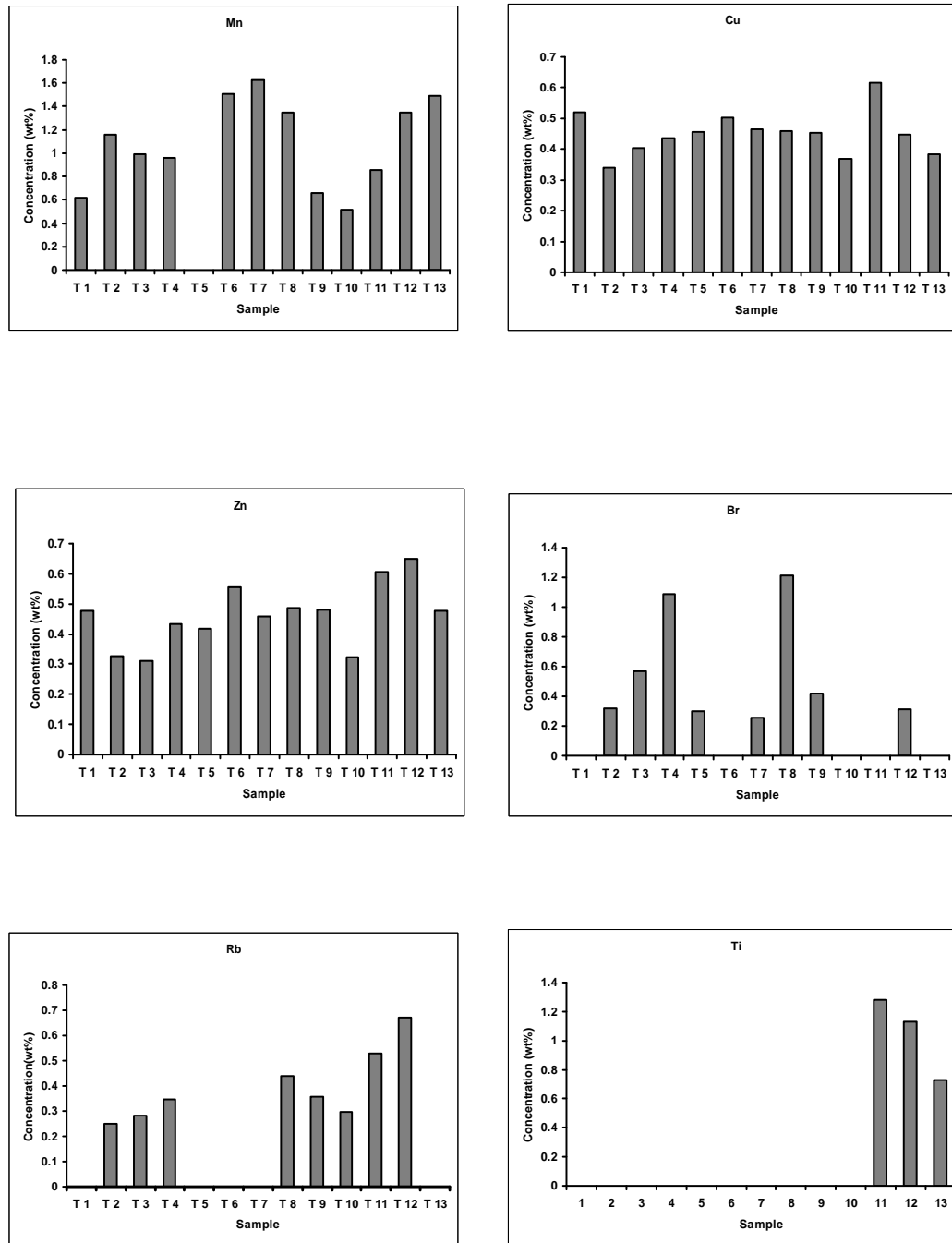


Figure 4. The graphs of manganese (Mn), copper (Cu), zinc(Zn), bromine (Br) Rubidium (Rb) and Titanium (Ti) concentration of the samples

In this work eleven elements: chlorine, calcium, potassium, iron, sulphur, chlorine manganese, copper, zinc, bromine, rubidium and titanium were found quantitatively.

Calcium was found in all samples as maximum concentration 59.133 wt% in sample T1 and minimum concentration 46.981wt% in sample T3.

Potassium was also found in all samples as maximum concentration 37.077 wt% in sample T4 and minimum concentration 18.967wt% in sample T9.

Iron was found in all samples as maximum concentration 9.667 wt% in sample T11 and minimum concentration 2.086wt% in sample T2.

Sulphur was found in all samples as maximum concentration 5.744 wt% in sample T4 and minimum concentration 2.791wt% in sample T2.

Chlorine was found only half of the samples as maximum concentration 12.289 wt% in sample T10 and sample.

Strontium was found as maximum concentration 1.146 wt% in sample T9 and minimum concentration 0.48346.981wt% in sample T8.

Manganese was found as maximum concentration 59.133 wt% in sample T7.

Copper was found as maximum concentration 59.133 wt% in sample T11 and minimum concentration 46.981wt% in sample T2.

Zinc was found as maximum concentration 59.133 wt% in sample T11 and minimum concentration 46.981wt% in sample T3.

copper, zinc, bromine, rubidium and titanium elements were found as small amount lower the 1 wt%.

Conclusion

In this study, the quantitative data calculated by the Shimadzu EDX-700 system showed the relative concentrations of elements contained in the samples of analysis. In addition, the qualitative and quantitative data calculated by the Shimadzu EDX-700 software showed that the toxic elements such as cadmium (Cd), nickel (Ni), mercury (Hg), lead (Pb), arsenic (As) and so on were not found in the samples analyzed in this work.

According to the measurements of present work, the comparisons of elemental concentration results were very useful for finding the harmful elements. The EDX 700 EDXRF spectrometer was even analyzed significantly minimum concentration measurement 0.025% rubidium in sample T2 therefore EDX 700 spectrometer is very suitable for finding the trace element. And it was observed that this technique is quick method to find out the unknown elemental concentration of the samples.

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References

- Grieken and R E V A A Markowicz 1993 "Hand Book of X-Ray Spectrometry" New York: Marcel Dekker
- Grieken R Van, Markowicz A and Veny P 1991" X-Ray Spectrometry 20,271 New York: Marcel Dekker
- Jenkins R 1974 "An Introduction to X-Ray Spectrometry" New York: Heyden and Son
- Joshi S K, Shrivastva B D and Deshpande A P 1998 "X-Ray Spectroscopy and Allied Areas" Narosa Publishing House
- Khin Mar Kyu PhD Thesis "Measurement of Elemental Concentrations and Radon Concentrations in Some Rock Samples and Cement Samples in Myanmar"
- Manual Book, 2002, Shimadzu EDX-700 Spectrometer, Universities' Research Centre, Yangon University