

Review Form 1.7

Journal Name:	Asian Journal of Research and Reviews in Physics
Manuscript Number:	Ms_AJR2P_114681
Title of the Manuscript:	SIGNIFICANCE OF USING SCANNING ELECTRON MICROSCOPY WITH ENERGY DISPERSIVE X-RAY SPECTROMETRY (SEM-EDX) FOR ANALYSIS OF GUN SHOT RESIDUE
Type of the Article	Review Article

Review Form 1.7

PART 1: Review Comments

	Reviewer's comment	Author's comment (if agreed with reviewer, correct the manuscript and highlight that part in the manuscript. It is mandatory that authors should write his/her feedback here)
<p>Compulsory REVISION comments</p> <ol style="list-style-type: none"> 1. Is the manuscript important for scientific community? (Please write few sentences on this manuscript) 2. Is the title of the article suitable? (If not please suggest an alternative title) 3. Is the abstract of the article comprehensive? 4. Are subsections and structure of the manuscript appropriate? 5. Do you think the manuscript is scientifically correct? 6. Are the references sufficient and recent? If you have suggestion of additional references, please mention in the review form. <p><u>(Apart from above mentioned 6 points, reviewers are free to provide additional suggestions/comments)</u></p>	<p>The manuscript "SIGNIFICANCE OF USING SCANNING ELECTRON MICROSCOPY WITH ENERGY DISPERSIVE X-RAY SPECTROMETRY (SEM-EDX) FOR ANALYSIS OF GUN SHOT RESIDUE" refers to the applications of SEM-EDX in the investigation, classification and discrimination of evidence material in forensic sciences.</p> <ol style="list-style-type: none"> 1. Although the manuscript reports on the importance of SEM-EDX as a tool for high resolution and magnification imaging and elemental analysis in the forensic sciences for the investigation of gun shot residues, car paint residues and glass residues, the authors did not provide sufficient scientific details to support its significance against other sensitive analytical techniques. 2. The title of the review article is not suitable, as it is not comprehensive enough. The authors refer only the analysis of gun shot residue in the title, although in the main body of the manuscript they are also referring to car paint residue and glass residue. Thus, an alternative title of the manuscript could be: "SIGNIFICANCE OF USING SCANNING ELECTRON MICROSCOPY WITH ENERGY DISPERSIVE X-RAY SPECTROMETRY (SEM-EDX) FOR ANALYSIS OF EVIDENCE MATERIAL IN FORENSIC SCIENCES". 3. The abstract of the manuscript is comprehensive enough, but there is a point that could mislead the readers, as the authors state in the first sentence: "Forensic application of SEM are found mostly in areas where there is a need for good imaging at relatively high magnifications in combination with elemental analysis". The authors could replace SEM with SEM-EDX in the aforementioned sentence. 4. The subsections and the general structure of the review article is considered below satisfactory, as there is a significant lack of cohesion between the different subsections, as well as among the different paragraphs of the same subsection. 5. According to my opinion, the authors in this manuscript overestimate the significance of SEM-EDX as a standalone analytical technique in forensic science evidence material. The results and conclusions are biased, as the advantages of SEM-EDX against the other available techniques are not taken into account by the authors, which is very important for the scientificity of the manuscript. 6. Although there are approximately 40 references, the one third of them are not recent (before 2000) and they are not considered sufficient for the extent of the manuscript. The authors are, especially, requested to provide appropriate references in five cases highlighted in the manuscript: a) about the magnification, wavelength and resolution of SEM and light microscope, b) about the generation of the X-rays of SEM-EDX, c) about the ability of SEM-EDX for qualitative and quantitative analysis, d) about the number of particles on a GSR sample and the circumstances affecting it, e) Gunshot Residue Subcommittee of Chemistry Scientific Area Committee in the organization of Scientific Area Committees (OSAC) for Forensic Science about the elements found in GSR. <p>Apart from these comments, the authors are also requested to comment and explain:</p> <ol style="list-style-type: none"> 1) Why they have selected SEM as a sensitive analytical method and which are other methods that could be used for such applications? 2) The chemometric analysis methods that could be used for the analysis of SEM-EDX data, as the sentence in the text is not specific enough. 3) Add in the caption of Figure 1 the meaning of the abbreviations used in the figure. 4) In the introduction section the authors have stated that the resolution of SEM is 5 nm, while in the "Experimental Details of SEM-EDX" section it is stated <1 nm. They are asked to 	

Review Form 1.7

	<p>correct to the right one and provide an appropriate reference.</p> <ol style="list-style-type: none"> 5) The authors are requested to consider if SEM-EDX is really an inexpensive technique according to the purchase cost, maintenance cost and the cost of sample preparation material, especially if gold-plated nanoparticles are required. 6) The abbreviations should be placed in parenthesis after the first time the complete phrase is found in the text. 7) The authors stated that lead (Pb) could not be detected through NAA; however, Pb could be detected through NAA as described in the following reference: 10.1007/BF02042613 8) If AAS is really more expensive than SEM-EDX. The authors are requested to provide an appropriate reference. 9) The authors are also requested to comment on the rest elemental techniques except for NAA, AAS and ICP-MS. TXRF for example is a non-destructive technique, less expensive than SEM-EDX and it could be used for the detection and quantitation of Pb, Ba, Sb, Br and Fe simultaneously. It is quick, simple in use and there is also the possibility of imaging if micro-TXRF is employed. 10) Although the authors provide information about ATR-FTIR and Raman spectroscopy for the detection of car paint residues, the significant advantages of the micro-techniques (micro-Raman and micro-IR) are not expressed thoroughly by the authors. Moreover, the advantages of the SEM-EDX towards micro-Raman and micro-IR for the identification of car paint residues are not presented in the manuscript. 11) The authors are requested to provide the full name of the techniques prior to their abbreviations, the first time they appear in the manuscript. In addition, it is suggested that the authors use in the whole manuscript the abbreviation EDX and not EDS, so as to be clearer to the reader. 12) The authors have stated in the section 2 of the manuscript that SEM-EDX is also used for quantitative analysis, but in the section 3 (glass residues) they refer only to the qualitative analysis. They are requested to comment on this. 13) The authors are requested to present a figure or a table with the meaning of the elemental ratios for the discrimination of different glass sources. 14) The authors are requested to provide why SEM-EDX is superior to the other analytical techniques (XRF, micro-CT, etc.) in the identification of glass residues. 15) The conclusions should be more informative and more comprehensive and not just a repeat of the main body of the manuscript. The authors are requested to rephrase the conclusions focused on the significance of SEM-EDX in the identification of evidence material for forensic science in comparison to other available methods. 	
<p>Minor REVISION comments</p> <p>1. Is language/English quality of the article suitable for scholarly communications?</p>	<p>The language quality of the review article could be improved, as there are some grammatical mistakes, over-simplified vocabulary and in some cases a non-scientific vocabulary.</p> <p>The authors are requested:</p> <ol style="list-style-type: none"> 1) to take care of the grammatical numbers in the manuscript. 2) to follow either UK English or USA English in the whole text. 3) to take care the use of the article "the" before the name of the technique and the article "a" instead of "an" prior to SEM. 4) to take care of the syntax and grammar of the manuscript. 5) to take care of using a more formal and scientific vocabulary. 6) to rephrase some sentences for a clearer meaning. 	
<p>Optional/General comments</p>		

[Review Form 1.7](#)

PART 2:

	Reviewer's comment	Author's comment <i>(if agreed with reviewer, correct the manuscript and highlight that part in the manuscript. It is mandatory that authors should write his/her feedback here)</i>
Are there ethical issues in this manuscript?	<i>(If yes, Kindly please write down the ethical issues here in details)</i>	

Reviewer Details:

Name:	Michail Lykouras
Department, University & Country	Institute of Chemical Engineering Sciences, Foundation for Research and Technology, Greece