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Journal Name:	International Research Journal of Pure and Applied Chemistry
Manuscript Number:	2014_IRJPAC_11187
Title of the Manuscript:	Electronic Transport at Low temperature in Ni/Al/Ni Films
Type of the Article	

General guideline for Peer Review process:

This journal's peer review policy states that **NO** manuscript should be rejected only on the basis of '**lack of Novelty**', provided the manuscript is scientifically robust and technically sound.

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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)
Compulsory REVISION comments	(1) Abstract of the article should not include the names of the equipment used for the research – for this there is a special section "Experimental details". (2) A structure and reactivity of the same multilayer system of Ni/Al/Ni was studied by means of molecular dynamics simulations using an embedded-atom method type potential [1]. It was shown that at temperatures of about 600K there is the massive diffusion of Ni in the Al and spontaneous novel phase formation. May be results obtained in the paper for the metal films grown at 473K, the semiconductor behavior of same structures, were defined by these novel phase... It looks, that these results should be discussed in the paper. (3) The name of the second section must be corrected. Authors should choose something one from this string: MATERIAL AND METHODS / EXPERIMENTAL DETAILS / METHODOLOGY (ARIAL, BOLD, 11 FONT, LEFT ALIGNED, CAPS) (4) Description of deposition systems and measurement equipment should be described in the second section and not in the abstract. Authors should use the SI units for the pressure. The authors write that the substrate temperature during deposition was 200°C, why duplicate it in Kelvin?	The names of the equipments are now removed from the abstract. The present films were deposited at 473K not at about 600K. The reason for depositing our films at 473K was to improve adherence of the magnetic film on the glass substrate. All our films exhibited only one (reasonably) sharp peak and that is identified to be (111). We believe that there may not be mixing at interfacial to any considerable extent leading to formation of intermetallic like compounds. The title of the second section is now pruned. Description of the equipment is now done only in second section and not in abstract. Temperature is written in the



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	(5) What is meant by: "...The films were annealed to room temperature in the vacuum chamber..."? The films were heated while deposition and cooled after that? Please explain... (6) In the abstract, authors described their thin film system as follows configuration: Ni(100nm)/Al(t)/Ni(100nm), however in the conclusion section is written that the system was Ni(100nm)/Al(t)Ni(200nm). What has been really? (7) In the section 3.1 (X-ray diffraction (XRD) studies, authors write that obtained spectra, similar for all samples, consist of single peak which is not identified. However, there are a lot of papers studied the Ni/Al bilayer or multilayer systems, see the paper of W.H. Xu, [2] for example, where similar peak identified as the Ni₃Al intermetallic phase (see figure 3). Due to diffusion and very thin Al sublayer, in the samples with low thickness Al, the intermetallic compounds should be formed. (8) All samples prepared and studied by authors were different on the Al interlayer only. The thickness was changed continuously with interval in 10 nm. However, the samples behaved differently with no relation to Al interlayer thickness. This result was not explained by authors. Perhaps the results are not reproducible? It seems that authors should explain this. Also, it should be shown the conductivity measurement results for all 10 samples. To eliminate the possibility of measurement error and non-reproducibility, the series of samples must be made at least in triplicate and the measurement results must be averaged. Analysis of obtained characteristics will be meaningful only after it will be shown that the measurement results are reliable.	units of Kelvin only. The pressure has been now converted into Pascal using 1 mbar=105 Pa and written in the bracket. Films were not deliberately annealed at 473K. Since the films were deposited at 473K and were taken out from the vacuum chamber in the next day morning. Meaning they were allowed to cool to room temperature overnight. This is now made it clear under experimental section. The configuration of the films is Ni(100 nm)/Al(t)/Ni(100 nm). The mistake occurred in conclusion section has now been corrected. The single peak observed for all the present films is now indexed to be (111). So, films can be said to in (111) texture. No scope for the formation of the phase like intermetallic compound . Our films differ from one another in
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	(9) In the section 3.2.3, two paragraphs before and after the table 5 are not relevant to this article. (10) The section 4, CONCLUSION, must shortly present the results achieved in the work. Unfortunately, conclusion of the considered manuscript are not sound and not show clearly the achieved results. (11) The last section, REFERENCES, it seems that the line space must be equal for all the text. References. 1. F. Baras, O. Politano, Phys. Rev. B 84, 024113, 12.07.2011. 2. W.H. Xu, X.K. Meng, A.H.W. Ngan, X.Y. Chen, Z.G. Liu, Mater. Let. 44 (2000) 314-318.	terms of the thickness of interfacier layer only. However, resistivity did not show any dependence on the interfacier thickness. Experiments were done twice and the same results were observed within small error limits. So, reproducibility of data was there very much. Now, the Resistivity versus temperature graphs for all the ten films are shown in the paper for clarity. Two irrelevant paragraphs appearing before and after Table 5 are now removed. The conclusion section is now precise written. Achieved results are clearly indidated. Line spacing for all the text is now made equal. Grammar corrections are done to the large extent. Redundancies are removed.
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<u>Minor</u> REVISION comments		
<u>Optional/General</u> comments	This work presents an original experimental investigation of the multilayer thin films system consisting of Ni/Al/Ni structures with various thickness of Al sublayer grown on glass substrates. Ni thin films were deposited by electron beam evaporation and Al thin films were obtained using thermal evaporation method. The influence of the Al sublayer thickness on the structure and resistivity of the system was studied in this paper. Unfortunately, the quality of the manuscript is low and does not warrant publication in its current form. In general, this research may be interesting for specialists working in the field and may be published in International Research Journal of Pure and Applied Chemistry after major revision.	