



SDI Review Form 1.6

Journal Name:	International Research Journal of Pure and Applied Chemistry
Manuscript Number:	2014_IRJPAC_9624
Title of the Manuscript:	Support Material Effect for Pt Catalytic Activity
Type of the Article	Original Research 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.

To know the complete guideline for Peer Review process, reviewers are requested to visit this link:

(<http://www.sciencedomain.org/page.php?id=sdi-general-editorial-policy#Peer-Review-Guideline>)



SDI Review Form 1.6

PART 1: Review Comments

	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>)
<u>Compulsory</u> REVISION comments	Support Material Effect for Pt Catalytic Activity I recommend that the manuscript be published after a few changes have been made. 1.The quality of the English language requires improvement throughout the manuscript. An example is the sentence on lines 132-134. That sentence has no verb. 2.Acronymns are sometimes used without being defined immediately. An example is line 56 where Pt/CB is used. It should be platinum on carbon black (Pt/CB). Other instances are: GNS in the first line of the abstract N-G in the first line of the abstract HPOG line 113 3.Line 97 The BET surface area of the commercial catalyst should be provided. 4.On lines 136 and 150, the supplier of the commercial catalyst should be identified.	



SDI Review Form 1.6

	5.Current density is compared at 0.9 V by the authors. If the comparison were made at 0.7 V, a different result would have been obtained. An explanation for the choice of the potential should be given. 6.Table 1 – Current density, j, has units of $[\text{mA cm}^{-2}]$. I assume the area is the “cm^{-2}” of the area of the glassy carbon working electrode, 0.283 cm^2. That should be stated clearly. The other area that might have been used is the BET surface area. 7.The sentence on lines 195-197 cites [reference 29] by Shao et al. (2011). I read this reference. Shao et al. explain the effect in terms of strong oxygen binding, not the “strong adsorbed intermediates” explanation that the authors have used. Furthermore, Shao et al. indicate that optimum ORR occurs at Pt particle sizes of 2.5 nm. The author’s results are consistent with the findings of Shao et al. if the authors were to make their current density comparison at 0.7 V. 8.Lines 224-228 Do the authors mean that subnano clusters have diameters less than 1 nm. Perhaps that is obvious. Nevertheless it should be stated. 9. Lines 227-228 The authors wrote “It is responsible causing the ORR activity of Pt/GNS is higher than Pt/N-G.” Do they mean “Subnano clusters are responsible for causing the ORR activity of Pt/GNS to be higher than	
--	---	--



SDI Review Form 1.6

	Pt/N-G.”? Shao et al. [reference 29] state that the Pt cluster size that gives optimum ORR is 2.5 nm, not subnano clusters. That contradicts the statement by the authors in lines 227-228. The authors need to explain this better. 10.Lines 246-248 I know the authors claim that the XPS binding energies are accurate to plus or minus 0.05 eV. Nevertheless the difference in binding energies between GNS (71.6 eV) and N-G (71.7 eV) is not large enough to really convince me that they might not be the same within experimental error ($71.6 + 0.05$ is the same as $71.7 - 0.05$). In other words the interaction between the Pt particles and the support is not the only explanation. Another explanation for the difference between GNS and N-G might be the fact that GNS has a BET surface area of 318 m²/g and N-G has a surface area of 594 m²/g. That suggests that the graphene sheets in N-G have fewer atomic layers than GNS. Perhaps the increased surface area is associated with more sites (edge sites?) with the very strong oxygen binding, that Shao et al. [reference 29] indicated were responsible for a low ORR. 11.Conclusion and Abstract – Consider the following: <table> <tr> <td>Pt particle Size [nm]</td><td>XPS BE [eV]</td><td>BET Surface Area [m²/g]</td></tr> </table>	Pt particle Size [nm]	XPS BE [eV]	BET Surface Area [m ² /g]	
Pt particle Size [nm]	XPS BE [eV]	BET Surface Area [m ² /g]			



SDI Review Form 1.6

	GNS	1.2	71.6	318	
	N-G	1.3	71.7	594	
	Since the particle sizes and binding energies are similar and the surface areas are different, perhaps the explanation for the difference between GNS and N-G is related to surface area. Perhaps the greater surface area has more sites on which the oxygen binding is very strong, as reported by Shao et al. I suggest that the conclusion and abstract be modified.				
<u>Minor</u> REVISION comments					
<u>Optional/General</u> comments					

Reviewer Details:

Name:	Marten Ternan
Department, University & Country	Chemical and Biological Engineering, University of Ottawa, Canada