Response to Reviewer 1

First, from your comments, some huge modifications have been made:

Your ideas remind me of what an article was needed when I began to touch gas nanosensors. Standing the position of the fresh, I struggle to revise this review, and some big modifications mainly include as follows:

1. Abstract, introduction and conclusion are reconsidered and rewrote.
2. In section 2, growth method of grain is introduced and more recent advances in nanoflowers are added.
3. In section 3, some diagrams of materials are added and advances are reselected.
4. In section 4, an investigation was remade and the mechanism has been introduced different from the manuscript and some mechanism diagrams are also added.

Aimed to your specific comments:

**Point 1:** (abstract): unfortunately, the abstract is written in bad non-scientific English… E.g: you don’t start a sentence with “how” in case it is not a question; you do not write “a worthy topic” in a scientific publication; “obstacles limit the application and utilization of gas sensors mainly include” is grammatically wrong – it should be “obstacles limiting”. Besides, obstacles don’t limit. You either have obstacles or limitations… Further on, what do you mean by “controlling the nanostructure” or “decoration of noble metals”? In my opinion you should rewrite the abstract from scratch.

**Response 1:** From your sincere advice, I have learnt the insufficiency of my English writing and decided to improve it. Your suggestion is very helpful for me. And I have rewritten the abstract as following paragraph, and I want to know if another revise is needed.

**Abstract:** Gas nanosensor is an instrument that converts the information of unknown gas(species, concentration, etc.) into other signals(for example, electrical signal) according to certain principles, combining detection principle, material science and processing technology together. As an effective application for detecting a large number of dangerous gases, gas nanosensor has attracted extensive interest. However, its development and application are restricted because of some issues such as low response, poor selectivity and poor selectivity, etc. To tackle these issues, various measures have been studied and will be introduced in this review, mainly including controlling the nanostructure, doping with 2D nanomaterials, decorating with noble metal nanoparticles and forming the heterojunction. In every section, recent advances and some typical researches as well mechanism will also be demonstrated.
**Point 2:** (Introduction): sources are missing. You definitely used some literature to provide the facts given in your introduction. Also your English skills seem to be not sufficient for a scientific publication. You SHOULD let a native speaker (or at least someone who has adequate English skills) check your paper before submitting it the next time. I assume that the rest of the paper is written in the same manner, so I will not comment on English any more. Also I have a feeling that you do not 100% understand what you are writing about… maybe it is because of your way of presenting the information…

**Response 2:** I'm so regret that I missed the sources that express our respect to predecessors and provide more information to other researchers. I have rewritten the introduction and also cited some references about my content(Line 22-63). And in next days, I will pay a lot time in studying English to improve my writing. I'm so sorry that I upload the manuscript with many disadvantages; however, I'm so grateful that you are so responsible and careful to figure these problems that I can get many useful things.

**Point 3:** not “reduced” and “oxide” bur “reducing” and “oxidizing”. Further on, you talk about the resistance but show the sensitivity S…

**Response 3:** I have corrected this error. And, maybe I didn't make it clear, response cannot be measured directly, and only can be calculated by Ra and Rg, so I introduced the calculation way under different condition.(Line 31-37+48)

**Point 4:** where did you read this? This definition seems odd to me.

**Response 4:** I have rewritten(Line 45-47). Aimed to response time, somebody think it is the period from a stable Ra to stable Rg; however somebody think it’s the period that resistance change reaches 90% of (Ra-Rg) (if Ra is bigger than Rg). In the manuscript, I chose the latter, and I have replaced it because I think maybe what you want is the former.

**Point 5:** maybe you wanted to say “controlling the type and morphology of the nanostructures”

**Response 5:** The error was made because that I didn't understand the relationship between morphology and nanostructure totally and this idea helps me a lot. I have revised it and this section to make an improvement.(Line 64)

**Point 6:** source?

**Response 6:** I'm so regret that I forgot them and I have added them in Table 2.(Line 73)

**Point 7:** the TYPE of the nanostructure

**Response 7:** The suggestion is useful. I have added it in the paragraph.(Line 74)

**Point 8:** how do you calculate when saying “twice”? the response for nanorods was 20s, for
Response 8: Maybe my writing misled you, in fact former content was the response/recovery time (denotes response speed) and latter is response (demonstrates the degree of response), which are different indices of sensors. I have rewritten it. (Line 84-86)

Point 9: what do all these abbreviations stand for?

Response 9: These are names that author made for his samples, I'm sorry that I didn't make it. And I have renamed them as sample 1, 2, 3.

Point 10: so how does the type of the surfactant influence the morphology and grain size? Are there any dependencies? You only write there IS an influence but it is by far more interesting, WHICH surfactant influences IN WHAT WAY...

Response 10: I referred it to deliver sufficient information to readers in the manuscript, and after revising I think maybe it's superfluous (it doesn't meaningful to this paragraph, this section or this article) and can be removed from this review, and you? Please inform me if it isn't proper.

Point 11: sources for your information about graphene?

Response 11: I have added it and there is a huge modification in 2D material. (Line 285-288)

Point 12: are you SURE fullerenes are zero-dimensional? I think they are 3D...

Response 12: 0D material refers to the material with three dimensions are in the nanoscale; 3D material refers to those assembled material. Three dimensions of fullerenes are in the nanoscale, it should be 0D material in my opinion.

Point 13: your chapter seems to deal with decorating 2D nanomaterials but you only describe 3 materials – graphene, MoS2 and BP. And only for MoS2 you talk about decorating it with Pd nanodots… either the header for this chapter is wrong or you provide wrong details...

Response 13: 2D material is a huge family, so I choose three typical materials and I'm so sorry that I didn't say it. (Line 276-277)

Point 14: I suppose you do not mean “decoration OF noble matal nanoparticles” but “decorating WITH...”. This is an interesting and important chapter – you should rewrite it in a clear and structured way...

Response 14: Thank you so much for the precious and valuable suggestion. I have replaced "of" with "with" (Line 373). Additionally, a reinvestigation this approach was made and a huge...
modification was made in this section.

**Point 15:** Equations 1 and 2: source?

**Response 15:** I have added the source of two equations and more related equations have been also introduced in this section. (Line 379-388)

**Point 16:** you call it a conclusion but provide just a summary or even a kind of “table of contents”. The CONCLUSION is missing. You don’t even try to analyse different methods, to compare the results obtained or to find out dependencies…

**Response 16:** Your advices let me realize my disadvantages. Therefore, according to my opinions, a simple compare about four approaches is made and characters that sensitive materials should with are also referred. I want to know if it should be revised again. (Line 495-518)