Curriculum Vitae. Short Version.

I. -) Personal Data:

Roberto Acevedo, PhD is nowadays an independent researcher, retired (last April, 2017) and fully engaged in research in three main areas: Basic and Applied Technology, Entrepreneurship and Social Business, Scientific Psychology and Higher Education. In his academic career, he was promoted to full Professor in both Universidad de Chile (UCh) and Universidad Mayor (UM).

He was appointed in a variety of positions as academician and administrator, in relevant positions, among others, such as: Dean of the Faculty of Engineering (UM), Head of Research and Development (UM), Member of the Senate (UCh), Member of Faculty Council (Facultad de Ciencias Físicas y Matemáticas. UCh), Head of the Departamento de Química (Facultad de Ciencias Físicas y Matemáticas. UCh). As for his studies are concerned, he became a Licenciado en Filosofía con mención en Química (Magister) at the Universidad de Chile (1974), PhD at both Birkbeck and King´s Colleges. University of London (1981), Held a post doctorial position at the Chemistry Department. Charlottesville. University of Virginia, USA (1982). Some of his academic distinctions are as follows: post doctorial position and fellowship at the University of Virginia, USA (1982), Honorary Research Fellow. University of London. UK (1984, 1985, 1990, 1991), Bursary of the EC. DG-XII (1991), Invited Speaker. Advanced Study Institute. NATO-ASI. Riva del Sole, Italy (1988), Visiting Professor at the City University of Hong Kong (1986), Key Speaker at two International Conferences held at the School of Business. Medgar Evers College. The City University of New York (2016), Editor in Chief. Section A. Inglomayor (www.inglomayor.cl) ISSN. 0719-7578, Editor of virtual library www.roberto-acevedo.cl,among a number of other academic distinctions.

Roberto Acevedo has focused his attention in both lecturing to a broad number of students in different topics and also in research in areas such as: Linear and non Linear Optics in New Inorganic Luminescent Materials of the Rare Earths, Dynamics of Crystals, Cooperative Effects, Jahn - Teller (Static and dynamics), Pseudo Jahn - Teller in Coordination Compounds of the Transition Metal and Lanthanide Complex Ions, Scientific Psychology, Advanced Studies in Higher Education, Social Business and Entrepreneurship. He has been the supervisor of a substantial number of students: 12, working for their academic degrees of MSc, DSC, and 78 working for their Professional Titles.

His outcome in research may be divided into sections: (a) National Publications: 128, (b) Publications in International Congress: 49, (c) Publications in electronic journals: 146 (d) International Publications (ISI): 82 and Author of 17 Books. Many Conferences delivered in Chile and Abroad.

Member of the Board of Editors: Journal of Social Business (JSB). www.journalofsocialbusiness.net, ISSN: 2045-1083, Chief Editor of the electronic magazines: Inglomayor (www.inglomayor.cl) ISSN: 0719-7578, Chief Editor (Virtual Library). Science and Technology (www.roberto-acevedo.cl) and member of the International advisory committee. National seminar on the role of microalgae in waste-water treatment Odishia India (February, 2017).

II.-) Centre of Nanotechnology. A working example.

The New Centre for Nanotechnology, is aimed to join together scientists, in the areas of pure and applied physics, quantum chemistry, applied mathematics, artificial intelligence and advanced computing sciences to start up an active research programme on relevant applications of relativistic and nonrelativistic quantum mechanics to both complex and nano-systems in highly complex new systems (new materials). The candidates are expected to exhibit a recognized scientific career and have obtained a PhD degree and/or a post doctorial position if applicable. It is both advisable and recommended to be in the position to show a regular publishing activity in both sound and well recognized journals, as well as to show lecturing skills. The candidates are expected to access to funding from different and qualify bodies both in Chile and abroad. It is more than welcome, applications from scientists in the condition to interact with research groups well established in developed countries. The applicants to these positions should send their updated curriculum vitae and a proposed research programme of activities (2-3 pages in English) to Professor Roberto Acevedo, PhD (roberto.acevedo@umayor.cl) along with two letters of references from senior and worldwide recognized scientists.

III.-) Research Advanced Center in Metallic and non-Metallic Resources and Applications to Engineering

The proposed Research Center has been designed so as to contribute to both basic and applied research, in both Chile and abroad. It is to be mentioned that there are a number of scientists in Chile and abroad willing to be included in the Center as a full time research and/or as an active member to exchange ideas and to do sound and solid research.

It is the main aim of this proposed Center to gather together scientists from different countries in subjects which are relevant to the global economy such as: metallic and nonmetallic resources, active research on rare earths, and environmental studies and applications, hydric resources, biotechnology and related subjects. There is a serious compromise with highly standards Laboratories in Chile and abroad.

The main goal is give life to a rather different laboratory leading to do high quality research in new materials and in general terms, science of the earth. We have agreed some terms to establish research collaborations with scientists in Europe, China. The United States and Latin America.

IV.-) A working proposal. An example.

Research Proposal: Synthesis, characterization and application of nonporous, amorphous and/or non-stoichiometric metal oxide and graphene systems.

Introduction:

Metal oxides nanoparticles are widely used and very important for lots of applications due to their particular properties like electrochromic effect, high reactivity, conductivity as a geometric function of the particle, photoelectric effect, and others. These can be produced by several means (arc discharge, laser ablation,

hydrothermal processes, chemical vapor deposition, carrier gas condensation, combustion processes, etc.) and due to those different ways of producing them, by controlling the control parameters, it is possible to also determine the particle's crystallinity (crystalline, semi-crystalline, quasi-crystalline or amorphous)

Some metals show a well-defined special properties, where oxidation states are actually a distribution between stable oxides, such as Molybdenum Oxide (MoO_{3-x}) and Tungsten Oxide (WO_{3-x}), and thus generating a wide range of oxides (instead of a couple for other cases), each of them displaying different properties.

On the other hand, graphene has become an excellent candidate to replace conventional metallic conductors, due to its remarkable conductivity, heat resistance and flexibility, becoming a state of the art material to study for energy storage, integrated circuits, solar cells, fuel cells, gas detectors, semi conductivity, structural and metrology applications.

Motivation:

Several applications in energy have been found for both non-stoichiometric and amorphous metal oxide nanostructures (for example Vanadium, Tungsten and Molybdenum oxides used as anodes for Lithium-Ion batteries, Tungsten oxides used for flexible and multicolor electrochromic devices, high sensitivity chemical sensors) and it's a state-of-the-art research line(all referred papers are at most 3 years old), improving current technologies and opening new possibilities for innovation, giving the enormous possible systems yet to synthesize.

Combining this with two main ways to synthesize graphene (Chemical Vapor Deposition and Laser Heat Reduction), we could open a wide variety of research topics, applications and patents.

Proposal:

There is a kind of particle missing in this area: Non-stoichiometric AND amorphous metal oxide nanoparticles. These have been scarcely reported, mainly due to the difficulty of producing them. Nonetheless, giving the potential for energy and electronic applications, this proposal's goal is to simplify their production by modifying the current method: Inert Gas Condensation or applying its conditions to a more effective method of production, to study them for their properties, stability and trying them as anodes for Lithium-ion batteries and thin films for electrochromic devices. We also propose to make integrated systems with graphene for further material research and potential applications.

Background:

Amorphous metal oxide nanoparticles exhibit valence distributions quite different than their crystalline counterpart. Non-stoichiometric metal oxide nanoparticles exhibit higher reactivity and bigger reactivity range than crystalline nanoparticles. Having both modifies the possible out coming properties and is worthy of study, since it could give more effective area for Lithium-Ion or Lithium polymer to deposit, and this could improve the charge density of batteries, and the higher reactivity could mean lower charge times as well. Considering that the state-of.the-art in energy research in batteries and solar cells is also focused in graphene, and it has a relatively low cost of production, trying to pioneer in this research area is a great opportunity.