Scientific Justification Statement

(1) Graphene nanoparticles are used for investigations since graphene shows continuous electrical conducting quality even at zero carrier concentration as the electrons motion in graphene is very high in contrast with other existing nanomaterials. Graphene is a rapidly rising star on the horizon of materials science and condensed-matter physics. This strictly two-dimensional material exhibits exceptionally high crystal and electronic quality, and despite its short history, has already revealed a cornucopia of new physics and potential applications, which are briefly discussed here. Whereas one can be certain of the realness of applications only when commercial products appear, graphene no longer requires any further proof of its importance in terms of fundamental physics. Owing to its unusual electronic spectrum, graphene has led to the emergence of a new paradigm of 'relativistic' condensed-matter physics, where quantum relativistic phenomena, some of which are unobservable in high-energy physics, can now be mimicked and tested in table-top experiments. More generally, graphene represents a conceptually new class of materials that are only one atom thick, and on this basis, offers new inroads into low-dimensional physics that has never ceased to surprise and continues to provide a fertile ground for applications. Most of the activity about graphene started to happen in 2008. Therefore, this field is very young, active, and promising. Theoretically, graphene is an ideal material which is used for hydrogen storage. Experimentally, however, there is much to do to achieve these goals. It appears as a recurring pattern in all energy storage modes that the careful, rational nanoarchitectonic design and proper spacing of individual graphene layers is crucial for high-performance energy storage devices. The spacing dimensions are crucial for the functional design of graphenes. Proper graphene spacing not only prevents restacking and keeps the surface area of graphene high. It also provides nanoengineered space for molecules and ions to intercalate. There is a lot to be done as graphene-based energy storage devices.

Now-a-days there is a rich experimental work about graphene nanoparticles conducted by different scientists and researchers because graphene recently appeared as an alternative energy storage material with superior properties, like light weight, chemically inert and low cost. Graphene, two dimensional sp^2 carbon atoms arranged in a honeycomb lattice, attracted worldwide interest after its discovery. Intrinsically, graphene is a layered structure, quite stiff and exceptionally strong. The fundamental physical properties of graphene especially mechanical strength, tensile stress, thermal conductivity and aspect ratio are enormously high. These excellent properties of graphene make it an advantageous entity for various applications such as conducting graphene polymer composites, strain sensor, energy related applications and in the biofield. The surface area of graphene is $2630\, m^2 g^{-1}$, which is significantly suitable for energy capacity utilizations.

(2) To the best of authors knowledge, the present study is the third theoretical study about graphene nanoparticles in literature (Please, it may be confirmed from the literature). So the paper is beneficial for the journal citations.

(3) Heat transfer in non-Newtonian Eyring Powell fluid plays a major role in technology and in nature due to its stress relaxation, shear thinning and thickening properties. In the present study graphene nanoparticles have shown

good thermal conductivity which plays significant contribution in cooling/heating.