Dear Sir/Madam,

Please find below our point-by-point response to the notes written in your review:

* Research goals and aims should be after introduction – Corrected.
* Chemical structures are drawn without adhering to common format etc.- Corrected
* Motivation, hypothesis and description of the thesis rationale are explained below:

The rationale behind the work was to investigate metalloporphyrins and their effect on oxygen and its species. Metalloporphyrins are crucial components of biological molecules and act as mediators of catalytic processes. The superoxide radical is one of the most harmful species in nature and is produced through the reduction of the most abundant molecule in nature, oxygen. These important molecules have been the subject of many publications by different academic groups examining various different aspects. These groups focused on investigations in aqueous and organic solvents, the "conventional solvents". However, in the present work we decided to use ionic liquids (IL) as solvents. The motivation for this was the advantage arising from their specific properties, which could be utilized by spectroscopic and electrochemical methods to identify reactive and unstable species that cannot be detected by investigation of mechanisms in conventional solvents.

The end target of our study was to characterize the system comprising metalloporphyrin and superoxide radical in IL, "MnP-O2·--IL", and elucidate its kinetics. The combination of two complicated chemicals, the metalloporphyrin and the superoxide ion, in addition to the IL solvent, led to the need to study each component of the system separately prior to investigating the combined system. Therefore, the work started with the oxygen reduction process in ILs, followed by characterization of three metalloporphyrins with different metals in ILs. The next step was to investigate metalloporphyrin-mediated oxygen reduction, which led to the conclusion that manganese porphyrin is the most effective macromolecule of the oxygen and superoxide species, with the same activity as superoxide dismutase in ILs. The knowledge gained by this stage led us to investigate the kinetics of superoxide ion in ILs and how it is affected by the presence of manganese metalloporphyrin. Indirectly, this work provided information about ILs as solvents and it was found that the type of IL affected the stability of reactive species in IL.

A discussion of the results is presented in the thesis and explanations of the results. A thorough discussion and conclusions are provided with the conclusions of each system.

In general, the findings of the current work were the outcome of two main goals. The first was to elucidate the basic science of each of the main materials in this study, oxygen and metalloporphyrins. The characterization of each component led to the second goal, to investigate the combined system of metalloporphyrin, oxygen and IL.

Oxygen reduction has been studied by other groups in various ILs, however the metalloporphyrins have not been investigated thoroughly. Our study started from oxygen reduction and proceeded to spectroscopic, electrochemical and spectroelectrochemical characterization of the metalloporphyrins and finally to the combination of both components, providing an understanding of the mediating role of metalloporphyrins in oxygen reduction. The investigation included metalloporphyrins with three different metal ions, cobalt, iron and manganese. The best mediation of oxygen was achieved by manganese metalloporphyrin. Moreover, it was concluded that this metalloporphyrin has a double function on the oxygen electron transfer reaction. On the one hand, it acts as an oxygen mediator, but on the other it has superoxide dismutase activity, which destroys the superoxide radical. Therefore, further work focused on the investigation of this metalloporphyrin. In addition, the kinetic studies that were carried out on this combined system with the three potential categories of ILs as solvents are presented, demonstrating how these solvents affect the electron transfer mechanism.