6. CONCLUSION

L-SNEDDS of PPK, CRM and their combination were successfully developed (both lower dose and L/2 dose) with Labrafil® M1944 CS, Tween 80, and Transcutol® P as the components. BBD was used to optimize the formulation variables. The optimized batch of L-SNEDDS was solidified by using hydrophilic and hydrophobic solid carriers to form S-SNEDDS using spray drying technique. This was followed by their detailed evaluation through micromeritic, biopharmaceutics and stability studies. It was observed that flow and compression properties were dependent on carrier and spray drying technique used. The formulated S-SNEDDS prepared by using Aerosil® 200 as hydrophobic carrier and spray drying, were found to be reconstituted into nanoemulsions with unchanged droplet size and drug release when subjected at different stress conditions such as thermodynamic stress, freeze thaw cycles, dilution and pH variations and accelerated stability studies. *In vitro* dissolution studies revealed that the L-SNEDDS and S-SNEDDS were found to be remarkably superior over the naïve PPK and CRM. DSC and PXRD revealed that crystalline drugs (PPK, CRM or PPK-CRM) were present in the form of amorphous state in the SNEDDS formulations prepared with Aerosil® 200 as carrier. The findings of current study, therefore, ratified successful selection of solidification process for L-SNEDDS and forecasts production of S-SNEDDS at larger scale using spray drying. One can have better control on critical processing parameters that could affect responses such as flow, compression and dissolution behavior, of S-SNEDDS that are meant for delivery of lipophilic and GI labile drugs. The statistical comparison of biochemical parameters and histopathology results of 28-day antidiabetic activity carried out on STZ induced rats, also revealed significantly better antidiabetic potential of PPK, CRM or their combination loaded in S-SNEDDS as compared to their naïve forms. In nutshell, this improvement is expected to lead towards a better treatment strategy for patients suffering from DM, when PPK-CRM S-SNEDDS could be used for longer time without causing any side effects. However, the comprehensive conclusion would be formed only after clinical trials of the formulation.