6.1. Summary of Matrix Type Transdermal Patches of Indomethacin

In this research study, solvent evaporation technique was employed to prepare and evaluated transdermal patch of Indomethacin. The most important objectives was formulate patch for control diffusion, reduced regularity of dose with better patient fulfillment. Standard Calibration Curve of Indomethacin at pH 7.4 and FTIR Spectrum were done. The compatibility parameters characterization was done by FTIR method. Eleven batches were formulated use different polymer in various ratio and combinations among plasticizer and penetration enhancer. Mercury was used as a substrate for pouring the polymeric solution and patches were evaluated for uniformity of thickness, weight-variation test, folding-endurance, tensile-strength, % elongation, % flatness, % moisture absorption, Moistures vapor transmittance rate, assay done. Cellophane membrane employed for the diffusion study. Stability studies for drug diffusion of optimized batch F8 at 40°C and 75% RH for 180 days.

The weight difference was found between 474-483mg. The width of film found to be in range of 247.81 ± 6.89 to 259.15 ± 5.93. The Tensile-strength of film found to be in range of 3.93 ± 0.15 to 5.94 ± 0.17 N/mm². Flatness of all prepared patches was found to be 100%. Folding-Endurance of patch found to be in range of 69.23 ± 7.29 to 120.87 ± 5.86. The drug contents found in between 97.91 ± 0.27 to 100.41 ± 0.31 %. The % moisture absorption at 75% RH for all batches found to be in range of 2.47 ± 0.21 - 4.54 ± 0.19 %. The % moisture absorption at 84% RH for all batches found to be in range of 3.12 ± 0.31 to 4.98 ± 0.20 %. Moisture vapour transmission rate for all batches found to be in range of 1.58 ± 0.21 to 3.87 ± 0.32%. % Elongation for all formulation was in the range of 40.46 ± 5.32 to 72.43 ± 4.23%. The In vitro diffusion studies were performed in phosphate-buffer pH-7.4 for 24hours. The batch F8 was optimised batch of Indomethacin transdermal patches prepared by using HPMC E5: EC (6:4) Showed good physical properties and ideal
release kinetics. The formulation F8 showed the maximum diffusion through the membrane for 24 hours. It showed the diffusion of 75.28%.

6.2. Summary of Drug Reservoir Transdermal Patches of Piroxicam

The main objective of formulate drug reservoir type the patch for control diffusion, reduced regularity of dose with better patient fulfillment. The Preformulation parameter was evaluated such as solubility, standard calibration curve and drug and polymer interaction parameters characterization was done by FTIR method.

The Thickness of Piroxicam patches were found to be in range of 0.42 to 0.45mm and shows uniformity in thickness of patches. The Folding-Endurance of patch was found to be satisfactory between 90-130, and this shows that patches would maintain their integrity and not break easily during handling. The tensile strength was found to be in satisfactory ranges. The percent elongation was increasing in the range of 40 - 72% with increased concentrations of hydro-philic polymers and films shows 100% flatness. The moisture uptake increased as concentrations of hydro-philic polymers increases, the % moistures uptake of Piroxicam patches were between 2.46-4.72% and the % moisture content of Piroxicam patches were between 2.13-3.56%. Moisture vapour transmittance rate increases as the concentration of hydrophilic polymer increases between the ranges 1.21-2.73%. This showed uniformity in weight of patches in between 160.33 – 161 mg. reservoir type transdermal patch of Piroxicam were prepared. Formulation F6 using (2% of PVP K30) showed linear release of Piroxicam up to 94.81% in 24 hr. study, with further increase in PVPK30 concentration showed higher initial release up to 10 hr. and later on release decline.

Finally Stability study was performed at temperature 40°C and 75%RH for 180 days for optimized formulation F6. There was negligible changes occurs such as drug content at 0 days was 97.58 % and after 180 days 96.11%. Cumulative % drug diffuse at 0 days was 94.81and after 180 days 94.12%.
6.3. Summary of Bilayered Membrane Moderated Type Transdermal Patches of Ondansetron HCl.

The main objective of formulated bilayered membrane moderated type transdermal patch for control diffusion, reduced regularity of dose with better patient fulfillment. The Preformulation parameter was evaluated such as solubility, standard calibration curve and drug and polymer interaction parameters characterization was done by FTIR method. In this worked Bilayered membrane moderated type transdermal patch was prepared by solvent-casting method used HPMC-E15 as first polymer film, Eudragit-RLPO as second polymer film and polyethylene glycols 400 as plasticizers and oleic acid as penetration enhancer.

The weight uniformity was found between 212 - 285mg. Thickness variation was found to be between 400-536 µm. Tensile strength was found to be between 4.33 to 5.76 kg/mm² patches. The % moisture uptake of Ondansetron HCl patches were between 3.11 to 4.22 % at 75 % RH and 3.86 to 4.68 % RH at 85% RH. The moisture uptake increases as concentration of hydrophilic polymer increases and decreases as concentration of hydrophobic polymer increases. The % moisture loss for all the formulations was in the range of to 2.05 to 3.07 %. All the batches shows 100 % flatness and drug content 92.38 to 95.04 %. The In vitro diffusion studies were performed in phosphate-buffer pH-7.4 for 24hours. The formulation F6 showed the Linear Zero Order diffusion through the rat epidermis for 24 hours with cumulative % drug diffused of 87.75. Study was performed with 4cm² patch for which % drug diffused to maintain effective steady state plasma concentration 24 hrs.

Finally Stability study was performed at temperature 40°C and 75%RH for 180 days for optimized formulation F6. There was negligible changes occurs such as drug content at 0 days was 95.04 ± 0.74% and after 180 days 94.89%. Cumulative % drug diffuse at 0 days was 87.75 and after 180 days 88.52%.