Chapter -2

OBJECTIVE AND PLAN OF WORK
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2.1 Objective

- Assessment of compressibility of paracetamol in presence of talcum lubricated microcrystalline cellulose: Characterization of biexponential compaction process by tapping and applied pressure.

- Study of tabletability profiles of paracetamol prepared with MCC in different ratios with the presence of talcum.

- The change in apparent density of the biexponential process has been attempted to correlate (level A Correlation) with the tabletability at the same applied pressure.

- Effect of paracetamol/ MCC ratio on in vitro drug release has also been studied.

- To study the basic physico-chemical properties of the commonly used tablet excipients such as Hydroxypropyl methyl cellulose (HPMC K-100), Ethyl Cellulose, Hydroxyethyl Cellulose, Chitosan and Eudragit RL 100 (directly compressible and indirectly compressible) and binders to evaluate the compressibility by studying the porosity-pressure relationship in an attempt to understand, characterize, and compare the binding functionality of these materials and effect on the release rate of the drug.

- Investigation on effect of plasticizer such as propylene glycol, polyethylene glycol 400, Dimethylsulphoxide and triethanolamine on crystallinity and dissolution of telmisartan of HPMC buccal matrix films has been prepared.

- Swelling and erosion of amlodipine buccal tablets of HPMC-carbapol-cyclodextrin matrix system have been characterized. The relationship of swelling of amlodipine buccal tablets with buccoadhesion and buccal permeation have been determined.
2.2. Original contribution

- Characterization and improvement of the compaction of paracetamol in the presence of MCC a directly compressible excipient with talcum a superior in vitro lubricant.
- Application Biexponential equation in characterization of the paracetamol MCC powder formulation.
- Establishing correlation between compaction and dissolution of metoprolol directly compressed tablet with different polymers using Heckel and Kawakita models.
- Development a hydroxypropylmethylcellulose (HPMC) matrix film of telmisartan for improved buccal delivery using different plasticizers.
- Characterization of swelling and erosion and finding relationship of swelling with buccoadhesion and buccal permeation of various bilayer amlodipine tablets containing HPMC, carbopol and β- cyclodextrin.

2.3. Plan of work

- Determination and preparation of $\lambda_{\text{max}}$ and standard curve of the drug through UV spectroscopy.
- Characterization of the powder mixture before compression: Tap density, bulk density.
- Direct compression of the powder mixture
- Determination of tensile strength from crushing strength.
- Process characterization by application of Kawakita, Heckel and Kuno models.
- Swelling and erosion study of the buccal tablet.
- In vitro dissolution study and Ex- vivo drug permeation study.
- Establishment of correlation between compaction and dissolution of the tablets.
- Fabrication of matrix film of telmisartan. Study on effect of plasticizers on physical characteristics of the drug.

- Study of Physical properties of the film in terms of thickness, folding endurance, surface pH.

2.4. Instrumental analysis

- Fourier transforms infrared spectroscopy (FTIR) study.
- Differential scanning calorimetry study (DSC)
- Scanning electron microscopy study (SEM)
- X-ray diffraction analysis (XRD)
- Polarized light microscopy (PLM)