

An Overview: Pre formulation Study of Piroxicam

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Abstract- Pre formulation testing is the primary step within the levelheaded improvement of measurement shapes of a medicate substance. The pre formulation examinations affirm that there are no noteworthy boundaries to the compound's improvement as a promoted sedate. The definition researcher employments this data to create an efficacious, steady and secure dose frame. The most objective of the show investigate work was to do pre formulation think about of piroxicam medicate. Piroxicam (PC) is one of the foremost powerful non-steroidal anti-inflammatory operators that moreover has anti-pyretic action and has been utilized for the treatment of rheumatoid joint pain, osteoarthritis, enclosing spondylitis, tendinitis, bursitis, and for the torment that's not related to a musculoskeletal framework and traumatic wounds. The Central advantage of piroxicam is its long half-life, which grants the organization of a single every day dose. As the piroxicam is exceptionally successful sedate, numerous analysts utilize this medicate in their research. This term paper makes a difference those individuals who need to utilize piroxicam medicate for their research. Pre formulation testing is the primary step with in the judicious improvement of measurement shapes of a sedate substance. The pre formulation examinations affirm that there are no noteworthy obstructions to the compound's advancement as a promoted sedate. The detailing researcher employments this data to create an efficacious, steady and secure dose shape. The most objective of the show inquire about work was to do pre formulation consider of piroxicam sedate. Piroxicam (PC) is one of the foremost strong non-steroidal anti-inflammatory operators that too has anti-pyretic action and has been utilized for the treatment of rheumatoid joint pain, osteoarthritis, ankylosing spondylitis, tendinitis, bursitis, and for the torment that's not related to a musculoskeletal system and traumatic wounds. The Foremost advantage of piroxicam is its long half-life, which licenses the organization of a single every day measurements. As the piroxicam is exceptionally viable sedate, numerous analysts utilize this medicate in their inquire about. This term paper makes a difference those individuals who need to utilize piroxicam medicate for their inquire about.

I. INTRODUCTION

Pre formulation testing is the to begin with step within the sound improvement of dose shapes of a medicate substance. The pre formulation consider is the method of optimizing the conveyance of the sedate through the assurance of physicochemical properties of the unused compound that seem influence medicate execution and advancement of an solid, steady and secure dose shape. It gives the data required to characterize the nature of the sedate substance and give a system for the sedate combination with pharmaceutical excipients within the measurement shape. : Subsequently, Pre formulation thinks about were performed for the gotten test of the sedate for recognizable proof and compatibility thinks about. Pre formulation may be depicted as a stage of the investigate and improvement handle where the pre formulation researcher characterizes the physical, chemical and mechanical properties of a unused sedate substance, to create steady, secure and viable measurement frame. The pre formulation examinations affirm that there are no note worthy boundaries to the compounds improvement as a promoted sedate. The definition researcher employments this data to create dose shapes. Pre formulation may be a multidisciplinary improvement of a sedate candidate

PRINCIPLE AREA OF PREFORMULATION:

Bulk Characterization:

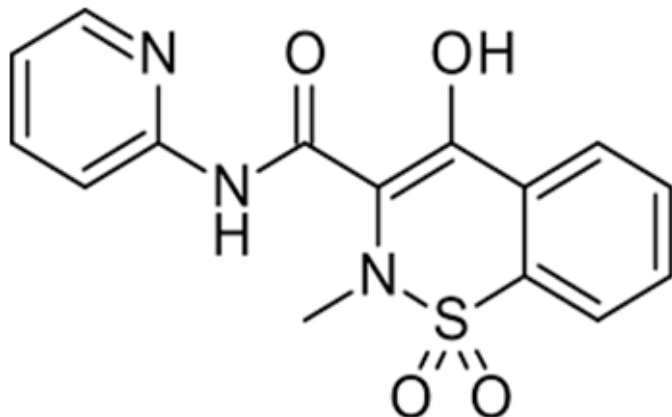
- i. Crystalline and polymorphism
- ii. Hygroscopicity
- iii. Fine particle characterization.
- iv. Powder flow.

Solubility Analysis:

- i. Ionization constant – p Ka.
- ii. pH solubility profile.
- iii. Common ion effect – KSP.
- iv. Thermal effects.
- v. Solubilization
- vi. Partition coefficient.
- vii. Dissolution

Stability Analysis:

- i. Stability in toxicology formulation.
- ii. Solution stability– pH stability profile.
- iii. Solid state stability - Bulk stability, Compatibility.

PIROXICAM:**PIROXICAM STRUCTURE**

Piroxicam is an oxycam subsidiary medicine having a place to non steroidal anti-inflammatory drugs (NSAIDs) gather, utilized to treat direct to extreme provocative illnesses such as rheumatoid joint pain, osteoarthritis, ankylosing spondylitis (Bechterew'smalady), tendinitis, bursitis, and for torment that's not related to musculoskeletal framework e.g. essential dysmenorrhea and postoperative torment. It diminishes torment, joint swelling, morning solidness, and moves forward the usefulness of the joints amid persistent polyarthritis. 2-PC has been classified within the biopharmaceutics Sedate Classification framework as a Lesson II sedate with solvency and tall penetrability. It illustrates a moderate and continuous absorption via the verbal course and encompasses a long half-life of end, rendering a delayed restorative activity and postponed onset of anti-inflammatory and pain relieving impact. 3-PC is well ingested taking after verbal organization; in any case, its utilize has been restricted by a number of side impacts, counting dying and ulceration. In spite of the fact that as piroxicam have distinctive side impacts but, its pharmacological activity is more as piroxicam is an compelling anti-inflammatory operator; it is an inhibitor of prostaglandin biosynthesis. The Vital advantage of piroxicam is its long half life, which licenses the organization of a single day by day measurements. Piroxicam is endorsed within the Joined together States for the treatment of rheumatoid joint pain and osteoarthritis. It also has been utilized within the treatment of ankylosing spondylitis, intense musculoskeletal disarranges, dysmenorrheal, postoperative torment and intense gout. This paper makes a difference to those individuals who need to utilize piroxicam medicate for

their inquire about. As piroxicam is exceptionally viable sedate numerous analysts utilize this medicate a few of the inquire about paper is recorded underneath:

1. Detailing and optimization of piroxicam oro dispersible tablets by central composite
2. Improvement of proniosomal sedate conveyance with a distinctive sort of entrance enhancers.
3. Characterization and in-vitro assessment of piroxicam suppositories .
4. Novel twofold stacked transfer some: prove of predominant anti-inflammatory adequacy- a comparative consider.
5. Plan and assessment of piroxicam micro emulsion .
6. Pharmaceutical co crystal of piroxicam : plan, detailing, and assessment .
7. Detailing and characterization of adaptable phosphatidyl choline vesicles for system icconveyance of piroxicam.
8. Orderly improvement of transthesomalgel framework of piroxicam: definition optimization, in-vitro assessment and ex-vivoppraisal.
9. Advancement and approval of a delicate UV strategy for piroxicam: application for skin penetration considers

EXPLORTORY WORK**Organoleptic Properties:**

The medicate tests were examined for appearance, color, and odor.

Dissolving Point:

The dissolving focuses of the drugs were decided by an open capillary strategy utilizing the dissolving point device.

Bright Spectroscopy:**Assurance of Greatest Wavelength (λ max):**

- a. **In Methanol:** Sedate (10 mg) was precisely weighed and exchanged to 100 ml volumetric carafe, volume was made up to the stamp with methanol to get quality 100 μ g/ml. It was utilized as a standard stock arrangement. This stock arrangement was advanced reasonably to deliver a concentration of 10 μ g/ml. The UV spectrums were recorded within the extend 200-400 nm by utilizing UV-Visible two fold pillar spectrophotometer (Shimadzu 2450). The wavelength of greatest retention (λ max) was decided and is appeared in Table 1.

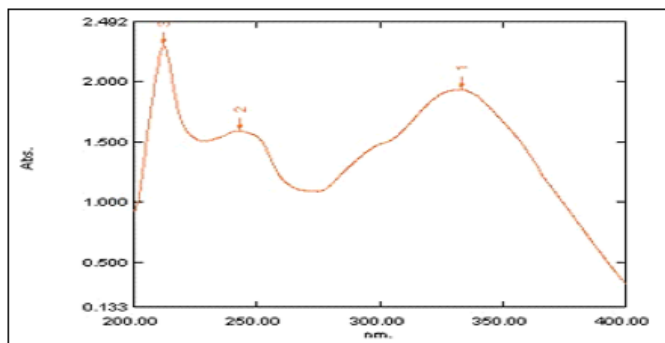


Table 1: λ_{max} FOR THE DRUG IN METHANOL

b. In methanolic HCl: 15 Medicate (10 mg) was precisely weighed and exchanged to 100 ml volumetric jar, volume was made up to the check with 0.1 M methanolic HCl to get quality 100 μ g/ml. It was utilized as a standard stock arrangement. This stock arrangement was advance weakened appropriately to provide a concentration of 10 μ g/ml. The UV spectrums were recorded within the extend 200-400 nm by utilizing UV-Visible twofold bar spectrophotometer (Shimadzu 2450). The wavelength of greatest retention (λ_{max}) was decided and is appeared in Table 2.

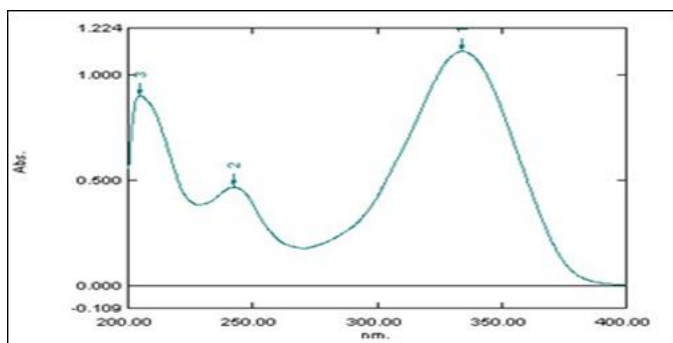


Table 2 : λ_{max} FOR THE DRUG IN METHANOLIC HCl

C. In Phosphate Buffer (pH-7.4): 20 mg of medicate was precisely weighed, exchanged into a 100 ml volumetric carafe and broken down in 15 ml of methanol. The volume was made up to 100 ml utilizing PBS pH 7.4 to induce a concentration of 200 μ g/ml. From the arranged stock arrangement, 10 ml arrangement was pulled back and exchanged to another 100 ml volumetric jar and volume were cosmetics to 100 ml to induce a concentration of 20 μ g/ml. The UV spectrums were recorded within the run 200-400nm by utilizing UV-Visible twofold bar spectrophotometer (Shimadzu 2450). The wavelength of most extreme assimilation (λ_{max}) was decided and is appeared in Table 3.

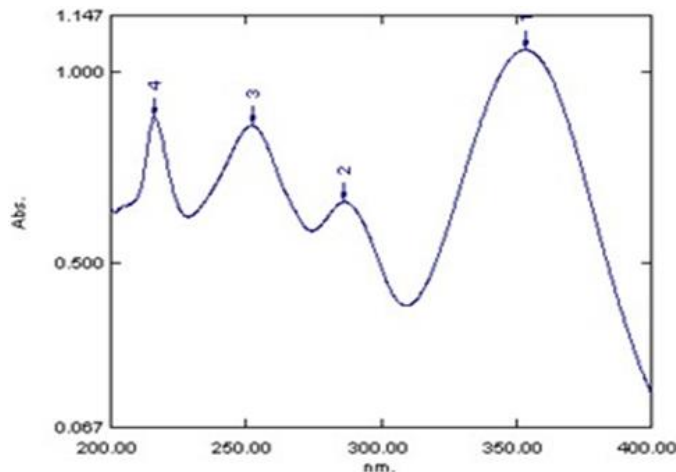


Table 3 : λ_{max} FOR THE DRUG IN PHOSPHATE BUFFER (pH-7.4)

Assurance of Beer-Lambert’s Plot:

a. In Phosphate Buffer (pH-7.4): 20 mg of medicate was precisely weighed, exchanged into a 100 ml volumetric carafe and broken down in 15 ml of methanol. The volume was made up to 100 ml utilizing PBS pH 7.4 to get a concentration of 200 μ g/ml. From the arranged stock arrangement, 10 ml arrangement was pulled back and exchanged to another 100 ml volumetric jar and volume was cosmetics to 100 ml to urge a concentration of 20 μ g/ml. From the over arrangement 1, 2, 3, 4, and 5 ml of arrangement swere independently exchanged into 10 ml volumetric carafes separately, and volume was made up to 10ml to induce a concentration of 2, 4, 6, 8, 10 μ g/ml individually. To check the wavelength maxima 20 μ g/ml arrangement was taken in a quartz corvette and filtered on UV-Visible twofold bar spectrophotometer in run of 200-400 nm. The above prepared tests were analyzed at 354nm (λ_{max}). Calibration Bend is appeared in table 4.

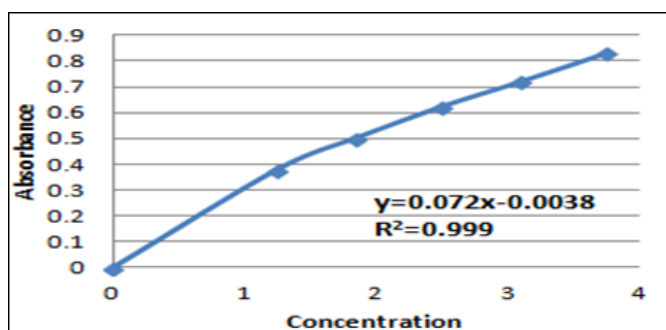


Table 4 : In Phosphate Buffer (pH-7.4)

b. In Methanolic HCl: 15 10 ml of 100 μ g/ml standard stock arrangement was weakened up to 50ml to get a standard working arrangement of 20 μ g/ml concentration which was utilized for assist weakening of the calibration bend. Aliquots (2.5, 3.7, 5.0, 6.2,7.5) ml of 20 μ g/ml working standard

solution comparing to 2.5-7.5 µg/ml were taken in a arrangement of 20 ml volumetric jar and volume made up with 0.1M Methanolic HCl. The absorbance estimations of these arrangements were carried out against 0.1M methanolic HCl as clear at 334.5nm. A calibration bend was plotted in table5.

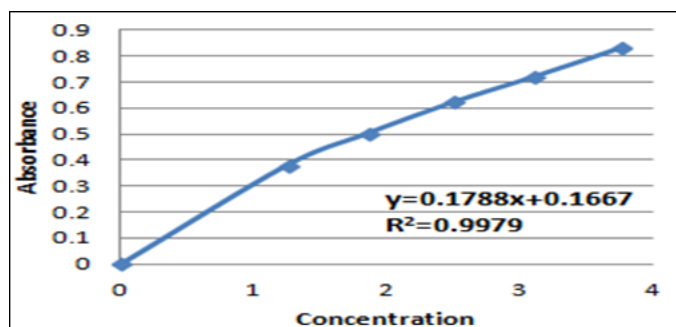


Table 5: λ_{max} FOR THE DRUG IN PHOSPHATE BUFFER (pH-7.4)

c. In Methanol: 20 mg of sedate was precisely weighed, exchanged into 100 ml volumetric carafe and broken down in 15 ml of methanol. The volume was made up to 100 ml utilizing methanol get a concentration of 200 µg/ml. From the arranged stock arrangement, 10 ml arrangement was pulled back and exchanged to another 100 ml volumetric carafe and volume was cosmetics to 100 ml to induce a concentration of 20 µg/ml. From the over arrangement 1, 2, 3, 4, and 5 ml of arrangements were independently exchanged into 10mlvolumetric carafes individually, and volume was made up to 10 ml to induce a concentration of 2, 4, 6,8, 10 µg/ml separately. To check the wavelength maxima 20µg/ml arrangement was taken in a quartzcuvette and filtered on UV-Visible twofold pillar spectrophotometer in run of 200-400 nm. The above-prepared tests were analyzed at 333nm(λ max). Calibration Curve is appeared in table 6.

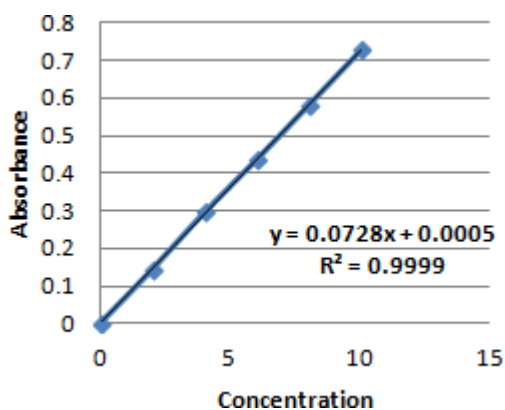


Table 6: BEER LAMBERT'S PLOT OF THE DRUG IN METHANOL

Dissolvability Ponder of Sedate:

15 Solubility considers of the medicate were carried out in numerous sorts of solvents which are utilized for encourage consider. Soaked arrangements were arranged by including an overabundance sedate to the vehicles and shaking on the shaker (REMI DGS-2) for 48 h at 25 ± 0.5 °C beneath steady vibration. After this period the arrangements were sifted, weakened and analyzed by UV spectrophotometer. Three judgments were carried out for each test to calculate the solvency of the sedate.

Fourier Change Infrared Spectroscopy of Sedate:

The infrared spectra of the unadulterated sedate were recorded by Shimadzu FT-IR spectrometer. Tests were arranged by KBr plate strategy (2 mg test in 100 mg KBr) and inspected within the transmission mode. Each range was measure over a recurrence extend of 4000-400 cm⁻¹. The comes about are appeared in Table 7.

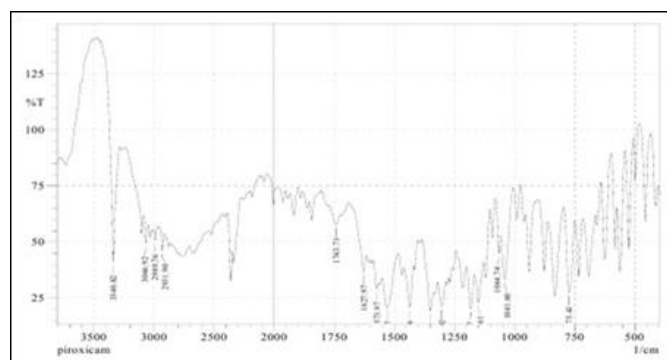


Table 7: IR SPECTRA OF DRUG

Differential Checking Calorimetry (DSC) Ponder of Medicate:

DSC investigation was performed utilizing Shimadzu-Thermal Analyzer DSC 60 on 2-5 mg tests. The test was warmed in an open nitrogen container at a rate of 10 °C/min conducted over a temperature extend of 30 to 230 °C for Piroxicam beneath a nitrogen stream of 2 bar weight. Thermogram, as appeared in induction, appeared in Table 8.

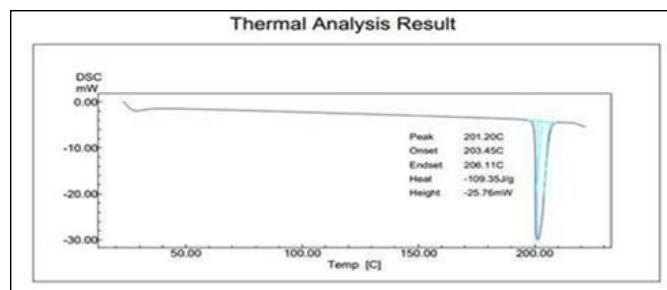


Table 8: DSC THERMOGRAM OF DRUG

Segment Coefficient (Kp):

The segment coefficient of the medicate was decided by shaking break even with volumes of oil and the fluid stage in a isolating pipe. A sedate arrangement of 1 mg/ml was arranged in refined water, and 50 ml of this arrangement was taken in a isolating pipe and shaken with an break even with volume of Octanol for 10 min and permitted to stand for 24 h with irregular shaking. At that point, the watery stage was tested before and after dividing employing a UV spectrophotometer to induce the segment coefficient values which is appeared.

II. DISSCUSSION**Organoleptic Properties:**

The Test of sedate gotten was studied for its Organoleptic characters such as color, odor, and appearance because it is one of the primary criteria for identification of compound and it appears results/properties which comply with detailed writing benchmarks.

1. Appearance Powder Off-white to light tan or light yellow powder
2. Colour White White / Off-white
3. Odor Odorless Odourless

Softening Point:

Agreeing to Indian Pharmacopoeia softening range/temperature of a substance is characterized as those focuses of temperature inside which / the point at which the substance starts to coalesce and is totally softened but as characterized something else for certain substances 68. The dissolving point of the sedate complies with the detailed writing values. The dissolving point of the medicate was watched to be within the extend of 197 °C-199 °C with decay, i.e. the substance characterize because it begins to dissolve which is appeared in Softening Point 197 °C - 199 °C 198 °C - 200 °C

Bright Spectroscopy:**Assurance of Maximum Wavelength (λ max):**

Greatest wavelength (λ max) is specific for each sedate substances, and it is additionally one of the distinguishing proof criteria. The most extreme absorbance is for medicate taken in methanol, methanolic HCl and phosphate buffer (pH- 7.4).

Planning of Lager Lambert's Plot:**In Phosphate buffer (pH 7.4):**

Brew Lambert's plot of the medicate was arranged in Phosphate buffer(pH 7.4).A direct relationship was gotten in between concentration (2-10 μ g/ml), and the absorbance of the medicate in phosphate buffer (pH 7.4) with an R2esteem of 0.999 at 276 nm is appeared in calibration bend appeared in Fig. 5 and line condition, $y= 0.072x+0.0038$.

In Methanolic HCl:

Lager Lambert's plot of medicate test was arranged in methanolic Hcl. A straight relationship was gotten in between concentration(1.25-3.75 μ g/ml) and the absorbance of the medicate in methanolic Hcl with an R2esteem of 0.9979 at 276nm is appeared in calibration bend appeared in Fig. 6and line condition, $y= 0.1788x-0.1667$.

Differential Checking Calorimetry (D.S.C.)**Ponder of Medicate:**

The endo therm of softening compares to the parcel of the DSC bend that's distant from the standard and afterward returns to it. Melting could be a physical handle that comes about within the stage move of a substance from strong to fluid. This happens when the inner vitality of the strong increment, ordinarily by the application of warm which increments the substance's temperature to the dissolving point. In DSC, as the temperature increments, the test inevitably comes to its melting temperature (T_m). The softening prepare comes about in an endothermic top within the DSC bend.DSC ponders were performed for sedate test. The DSC thermo gram of commercial sedate test is displayed.

Segment Coefficient (Kp):

The penetrability coefficient was found to be 3.09 which demonstrate that sedate test is lipophilic and come beneath tall (esteem 3-4) course and comes about were appeared . It is worth noticing that this is often a log P=0 implies that the compound is similarly solvent in water and the dividing dissolvable. On the off chance that the compound includes a log P=5, at that point the compound is 100,000 times more dissolvable within the apportioning dissolvable. A log P=-2implies that the compound is 100 times more solvent in water, i.e. it is very hydrophilic (Kohler et al.,1988). Subsequently, from gotten result medicate have1000 times more solvent within the dividing dissolvable (octanol).

III. CONCLUSION

Within the display work, the pre formulation think about of piroxicam medicate was done .Pre formulation ponders have a critical portion to play in expecting definition issues and recognizing a consistent way in both fluid and strong measurement frame innovation. This ponder appears a palatable result for all characterization such as organoleptic properties, calibration bend, DSC, parcel co-efficient, etc. All comes about coordinated with the detailed standard.

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