Spectrophotometric Studies on Determination of Tenoxicam in Pharmaceutical Formulations via Complexation with Thorium (IV) Ion

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Outlines of Presentation:

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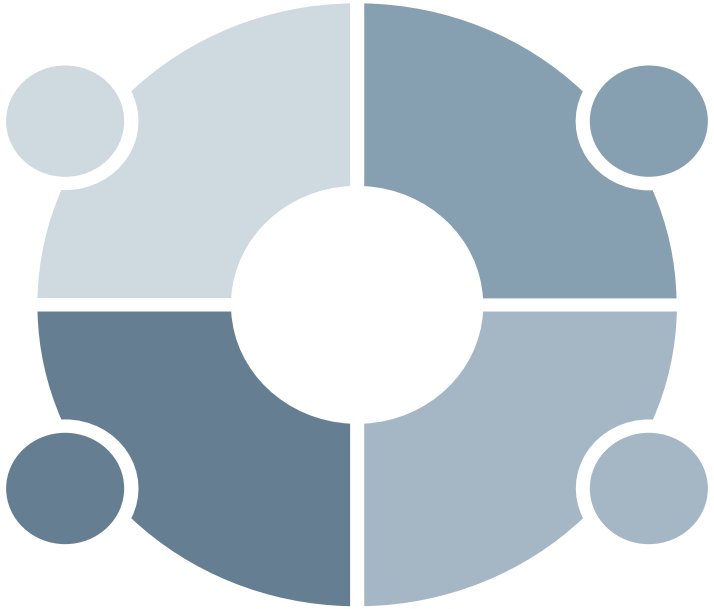
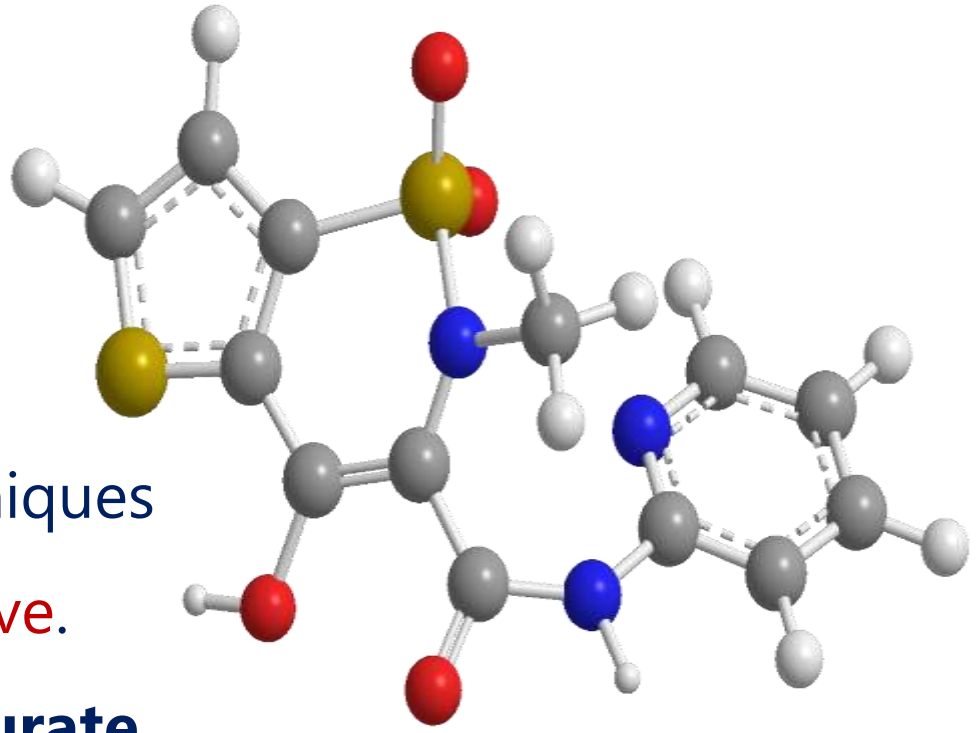


01

Introduction

Tenoxicam is a novel NSAID often used for treating musculoskeletal, and joint disorders, analgesic and relief of post-surgical inflammation.

The most common tenoxicam determination techniques are costly, time-consuming, and chemically intensive. Therefore, a **simple, direct, inexpensive,** and **accurate** method to assay tenoxicam in dosage forms.



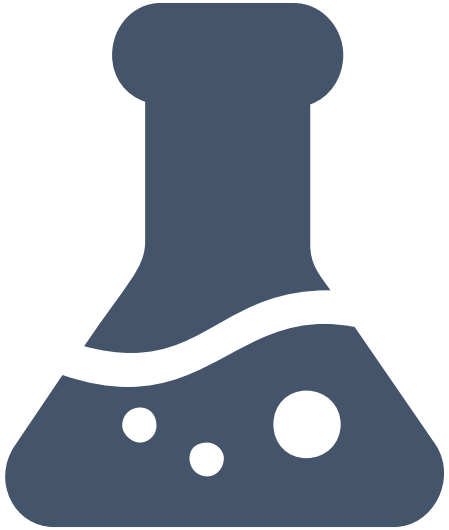
3D Chemical Structure of Tenoxicam

02

Aim of the Study

- **Bathochromic shifting** of Tenoxicam by complexation to maximum UV absorbance wavelength (λmax).

- The main objective of this study is the development of a new and simple **analytical method** for the determination of **Tenoxicam** in selected Pharmaceutical formulations.



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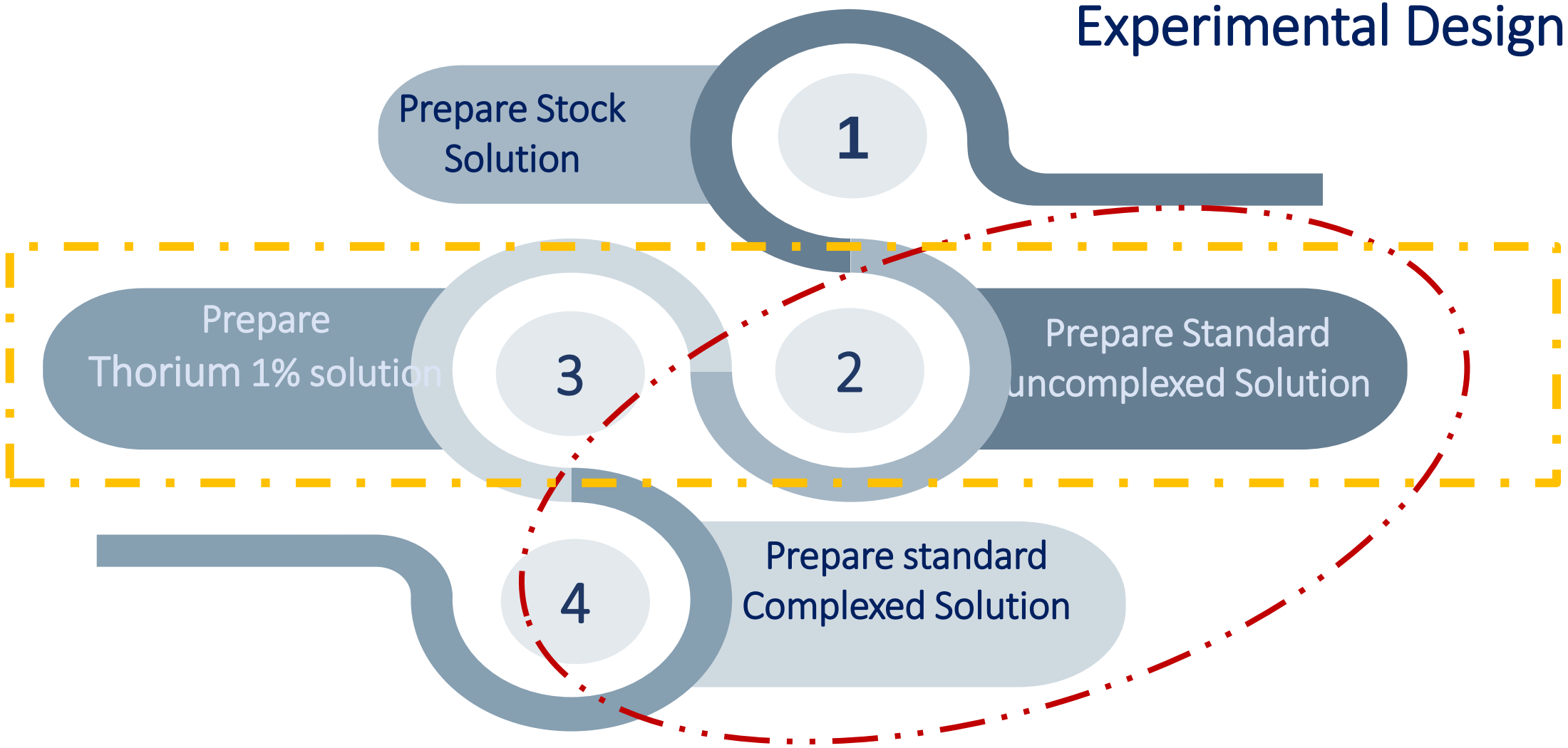
Experimental Design

Experimental Design



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Results and Discussion

Finding λmax of TNX -uncomplexed and TNX-Th4+ Complex solutions.

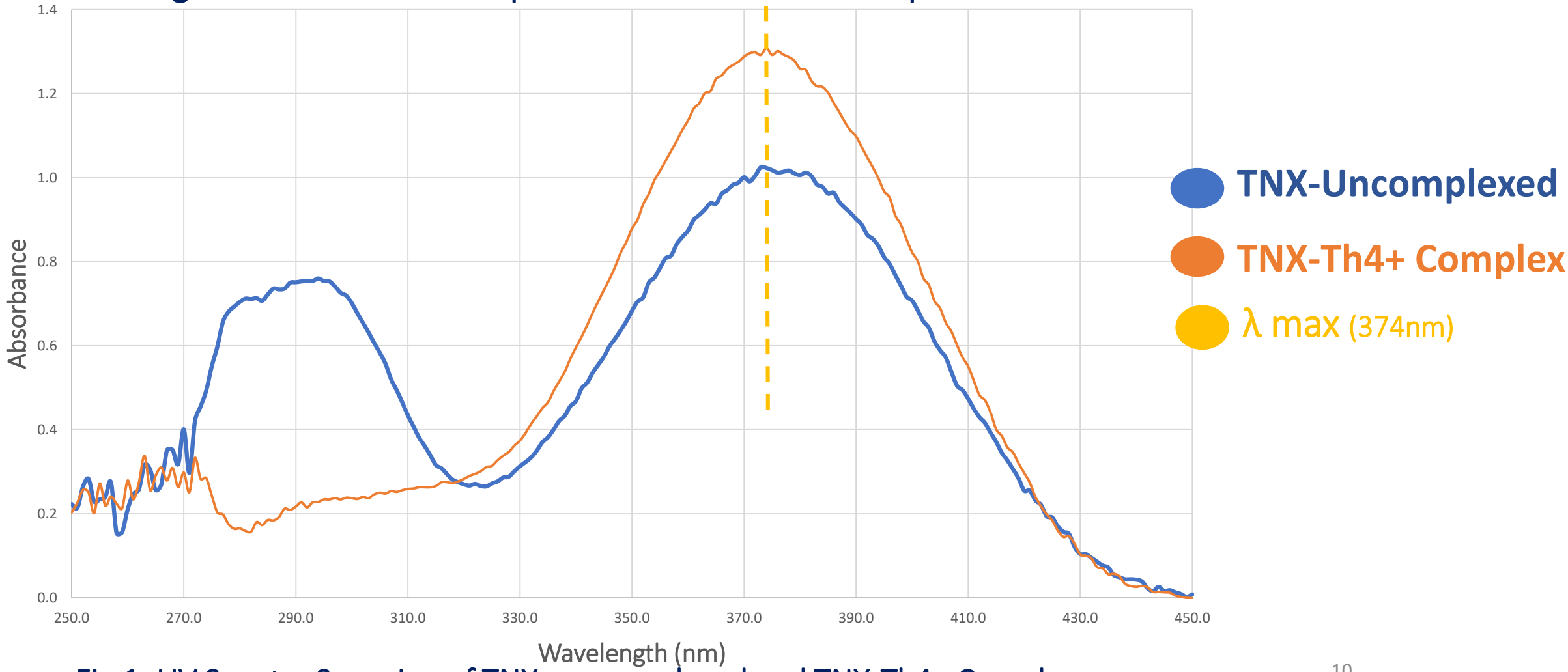


Fig 1: UV Spectra Scanning of TNX –uncomplexed and TNX-Th4+ Complex.

That means the TXM is present in the solution in a Zwitterionic state (ZWC). The chelating reaction of Tenoxicam with metal ions can be expected through three coordination sites (**-OH, —CONH, and N pyridine Ring**). (Mamdouh S Masoud et al., 2020).

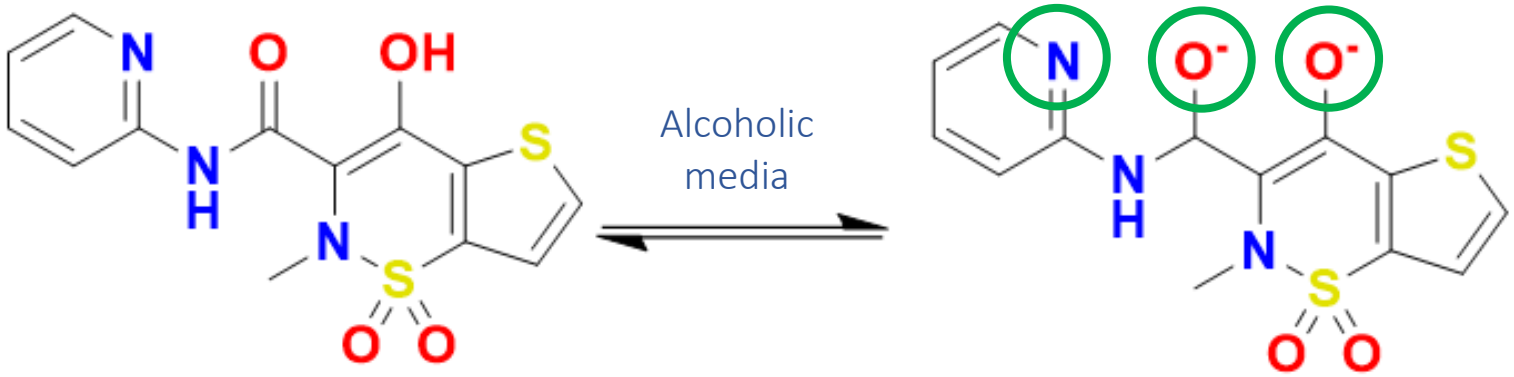
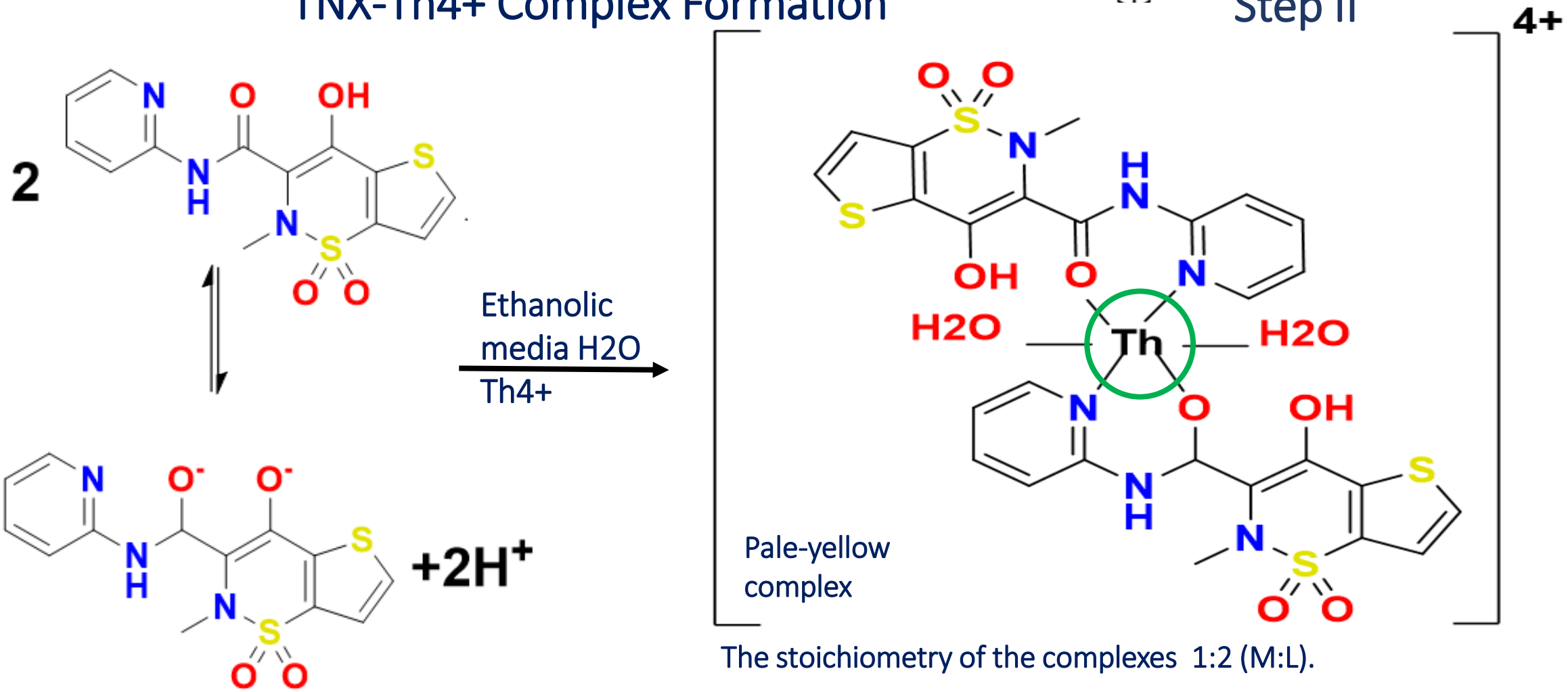


Fig 2: Structure For Dissociation Forms of TNX In Solution

Step I

TNX-Th4+ Complex Formation

Step II



The stoichiometry of the complexes 1:2 (M:L).

Fig 3: The mechanism of the formed complex (illustrates phase I and phase II of the formed complex. (Mamdouh S Masoud *et al*., 2020).

Effect of pH.

This complex is studied within a pH range of 4.5 to 12.3.

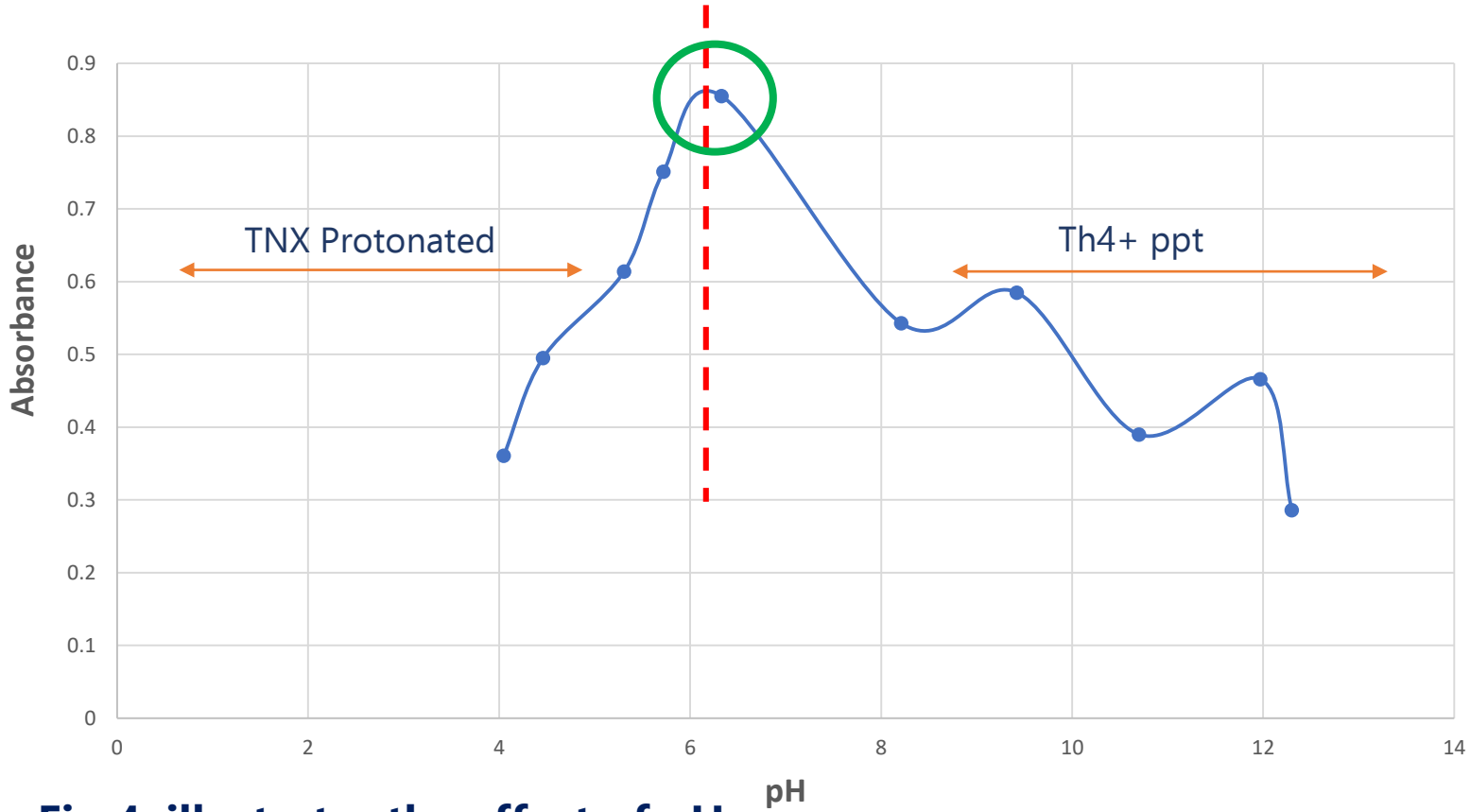


Fig 4: illustrates the effect of pH.

Effect of temperature

UV absorbance of a TNX-TH4+ complex generally decreases with increasing temperature, (According to the study (Ito, 1960), higher temperatures cause changes in the **electronic transitions** and **molecular structure** leading to dissociation and precipitation of the complex.

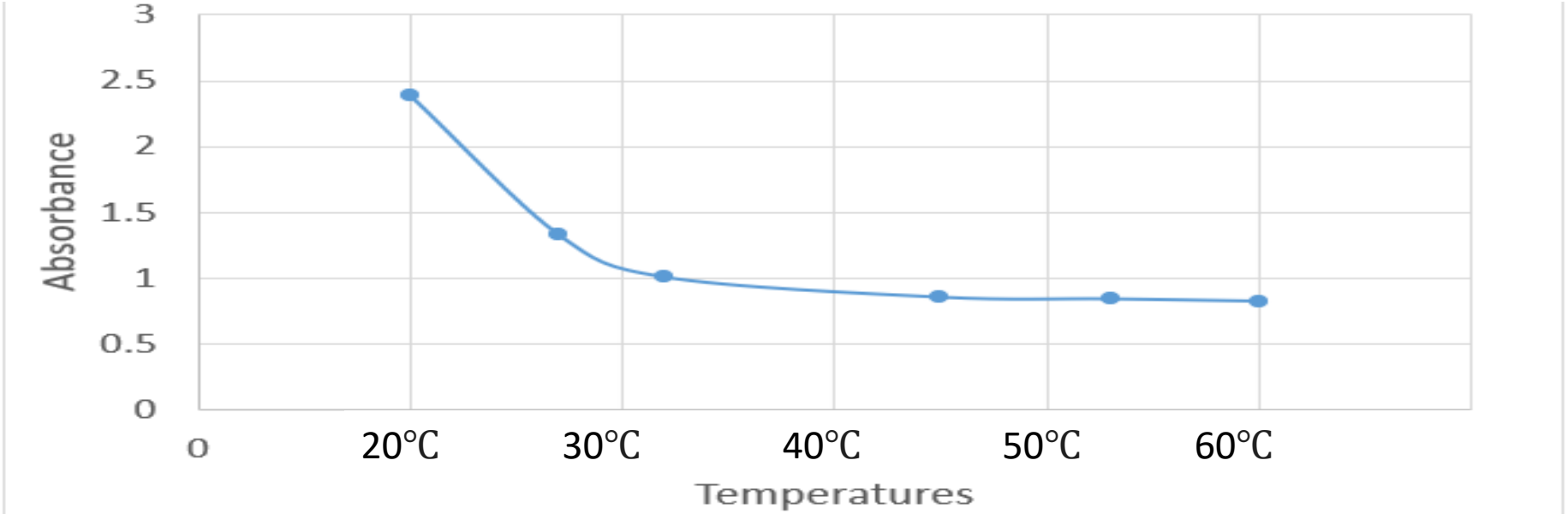


Fig 5: illustrates the effect of Temperature.

Assay of the content of TNX in selected Pharmaceutical Preparations for marketed brands.

The proposed analytical method for TNX determination in Tablets and suppositories.

Table 1: Assay of the content of TNX in(Tablet and suppositories)

Dosage form	Content (mg)	Absorbance	Founded concentration (mg)	Recovery (%)
Tablet	20	0.301	20.12	100.65%
Suppositories	20	0.285	19.77	98.85%

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Limitation and Future Perspective

➢ **Limitation:**

- There are limited options for tenoxicam-containing formulations only tablets, and suppositories are available.

➢ **Future prospectives:**

- Applying the assay method to test the contents of different generic Pharmaceutical products of tenoxicam.
- Extensibility of the assay method to other oxicam derivatives.

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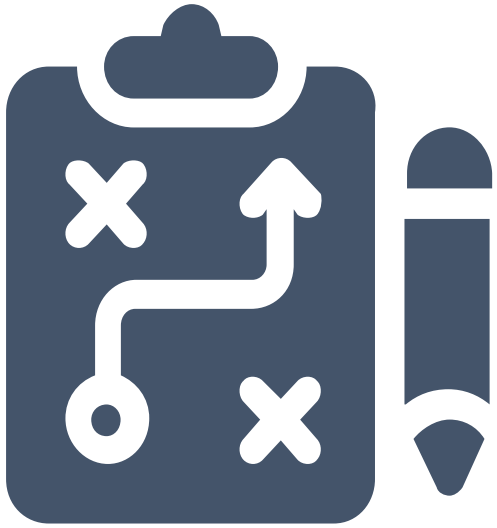
Conclusions

- **Based on the experimental results, could be concluded:**

The development analytical method is considered a novel approach for the determination of tenoxicam in tablets and suppositories.

The proposed spectrophotometric method is accurate (average recovery range 98.85-100.96%)

The proposed method was applied successfully for the assay of the Tenoxicam in selected pharmaceutical products



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Thank you for your attention