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Tailoring TiO_2 via surfactant-assisted Pechini method for enhanced surface area and electrochemical performance

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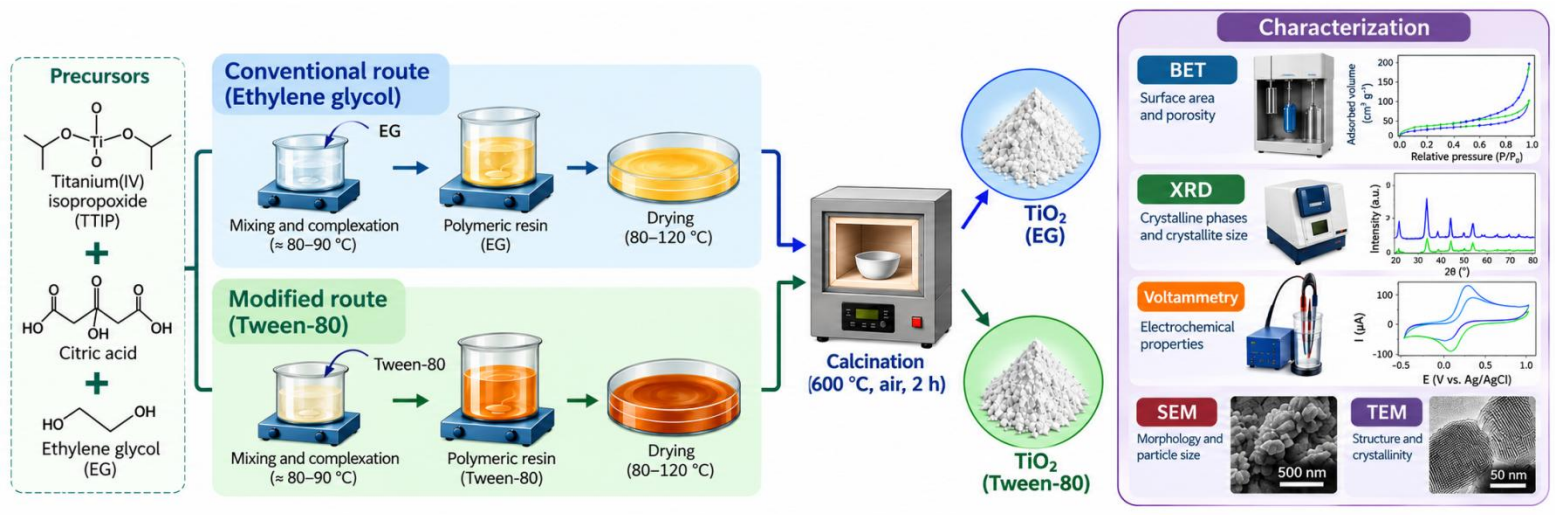
Introduction

Titanium dioxide (TiO_2) is a versatile semiconductor with promising applications in environmental remediation and electrochemical systems [1-3]. In this study, Tween-80 was employed in a modified Pechini method to enhance the porosity, surface area, and electrochemical properties of TiO_2.

Objectives

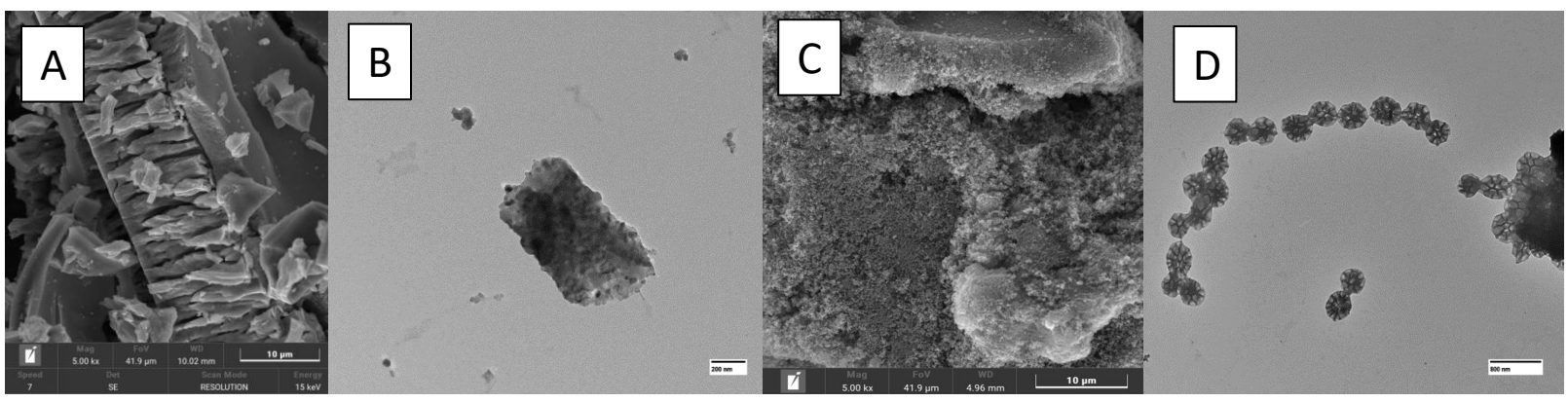
Investigating the influence of Tween-80 on the structural, morphological, and electrochemical properties of TiO_2 synthesized via a modified Pechini method, comparing its performance with the conventional ethylene glycol-based route.

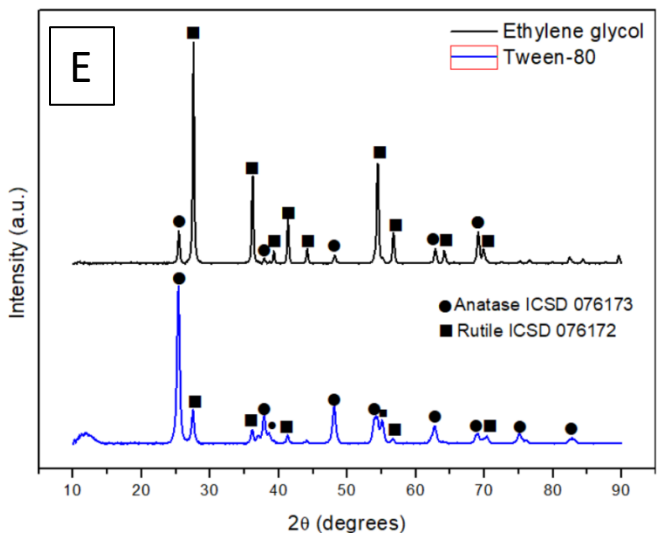
Methodology

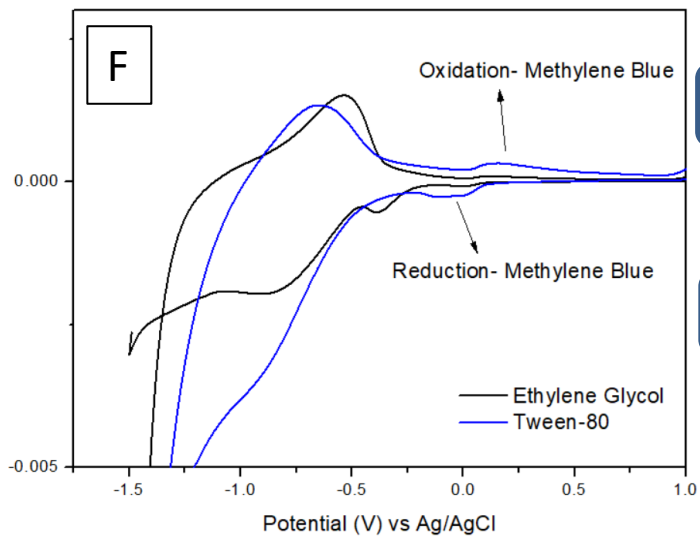


Results and Discussion

Figure 1A-F. SEM images (A-C) and TEM (B-D) images to TiO_2 powders using ethylene glycol and Tween-80 respectively. In E the XRD of oxides and in F the ciclyc voltammetry in three electrodes cell to methylene blue detection.







Ethylene Glycol
1.26 m^2/g
Tween-80
26.10 m^2/g
Improved surface area

Conclusions

The incorporation of Tween-80 into the Pechini increased the specific surface area of TiO_2 and anatase phase. These modifications improved the electrochemical performance of the resulting films, highlighting their potential for electrochemical sensing and energy-related applications.

References and Acknowledgements

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