

Seminar

Probing the Interfacial molecular structure and charge transfer process of the Co-Prussian blue with Vibrational Sum Frequency Generation and Transient Absorption Spectroscopy

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We present recent advances in nonlinear spectro-electrochemistry, combining surface-specific vibrational sum-frequency generation (VSFG) spectroscopy with electrochemical control to directly monitor charge-transfer processes at solid-liquid and solid-solid interfaces. This approach enables molecular-level characterization of buried interfaces of Prussian blue analogues (PBAs) in situ. In the second part, we extend these investigations to ultrafast timescales using transient absorption spectroscopy to probe femtosecond charge-transfer dynamics at the PBA/ZnO interface. These combined steady-state and time-resolved approaches establish a comprehensive framework for understanding interfacial processes in functional energy materials.

References:

1. Bera, A.; De, R.; Schmidt, H.; *et al.* Probing the Interfacial Molecular Structure of a Co-Prussian Blue *In Situ*. *Adv. Mater. Interfaces* 2024, 11 (20), 2470052.
2. De, R.; Hermesdorf, M.; Bera, A.; *et al.* Cyanide Linkage Isomerization Induced by Cobalt Oxidation-State Changes at a Co-Fe Prussian Blue Analogue/ZnO Interface. *Chem.–Eur. J.* 2024, 30 (60), e202401708.
3. Vajhula, A.; Bole, S.; Bera, A. Spectroscopic Characterization of Prussian Blue Analogues as Photoanodes in Water Oxidation—A Mini Review. *JCSoc.* 2026, just accepted.
4. Bera, A.; *et al.* Characterization of the Co-Prussian Blue Analogue Interface: Insights from *In Situ* Vibrational Sum Frequency Generation Spectroscopy. *J. Phys. Chem. C* 2026, 130, 16, 5818–5826

Thursday, May 7th 2026

16:00 Hrs (Tea / Coffee 15:45 Hrs)

Auditorium, TIFRH