Perovskite-structured $CaTiO_3$ coupled with g-C_3N_4 as a heterojunction photocatalyst for organic pollutant degradation

Ashish Kumar, Christian Schuerings, Suneel Kumar, Ajay Kumar and Venkata Krishnan*

Address: School of Basic Sciences and Advanced Materials Research Center, Indian Institute of Technology Mandi, Kamand, Mandi 175005, Himachal Pradesh, India

Email: Venkata Krishnan - vkn@iitmandi.ac.in

*Corresponding author

Additional experimental results

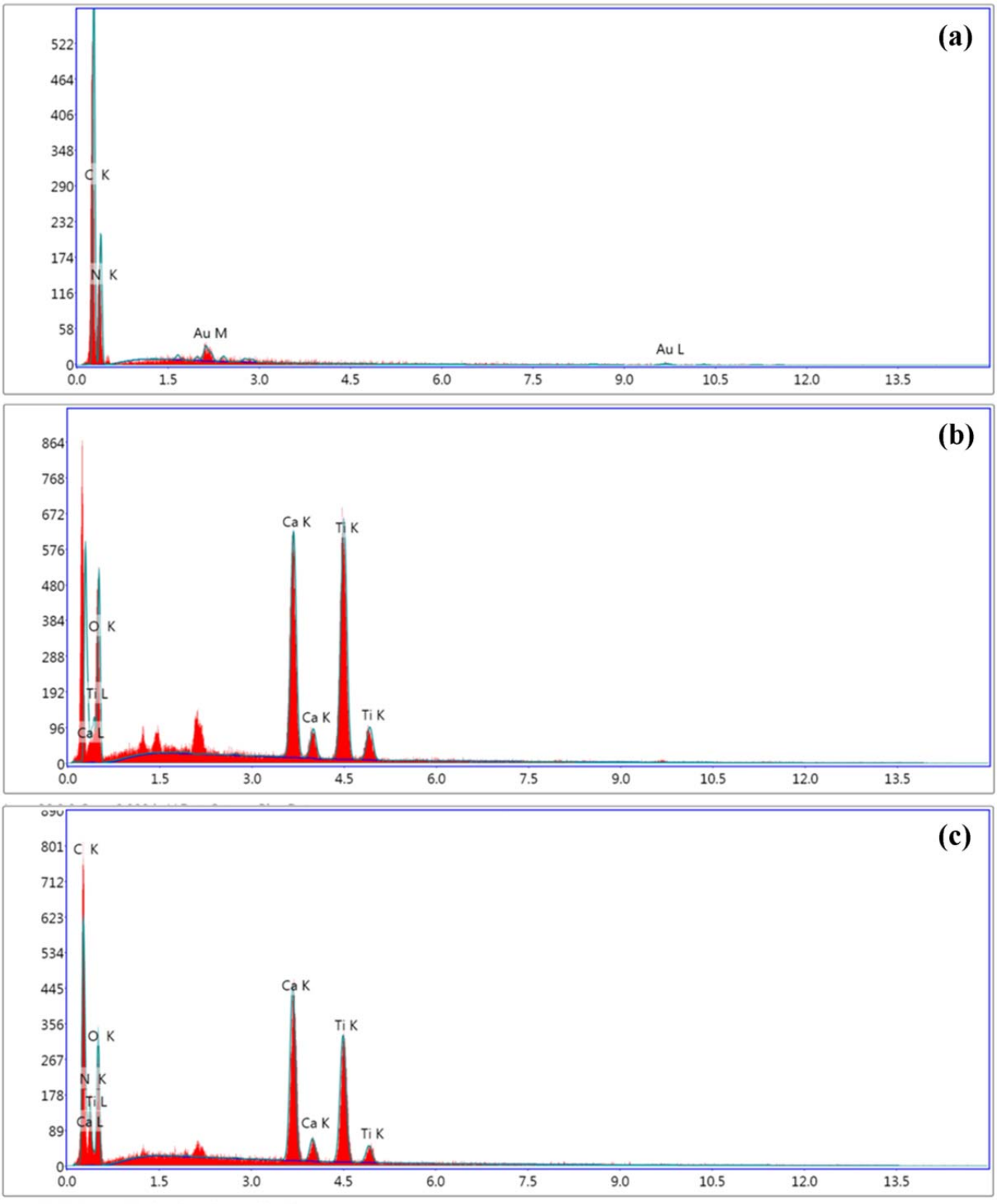

Figure S1. EDAX spectra of (a) g-C_3N_4, (b) CT and (c) CTCN heterojunction.

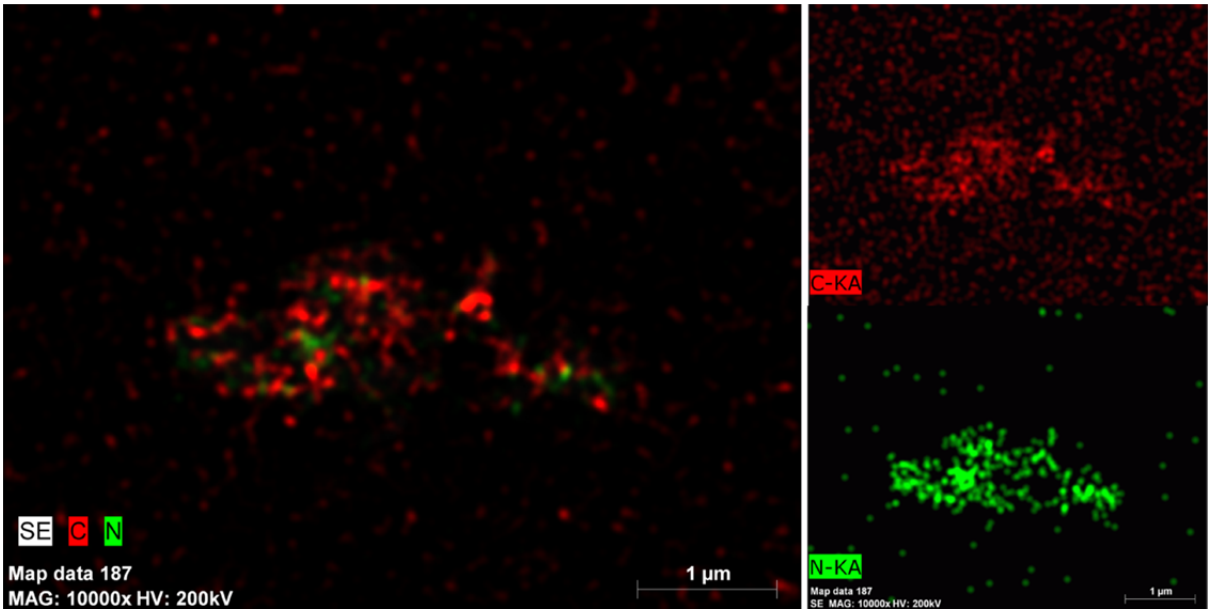

Figure S2. Elemental mapping of g-C_3N_4 sheets.

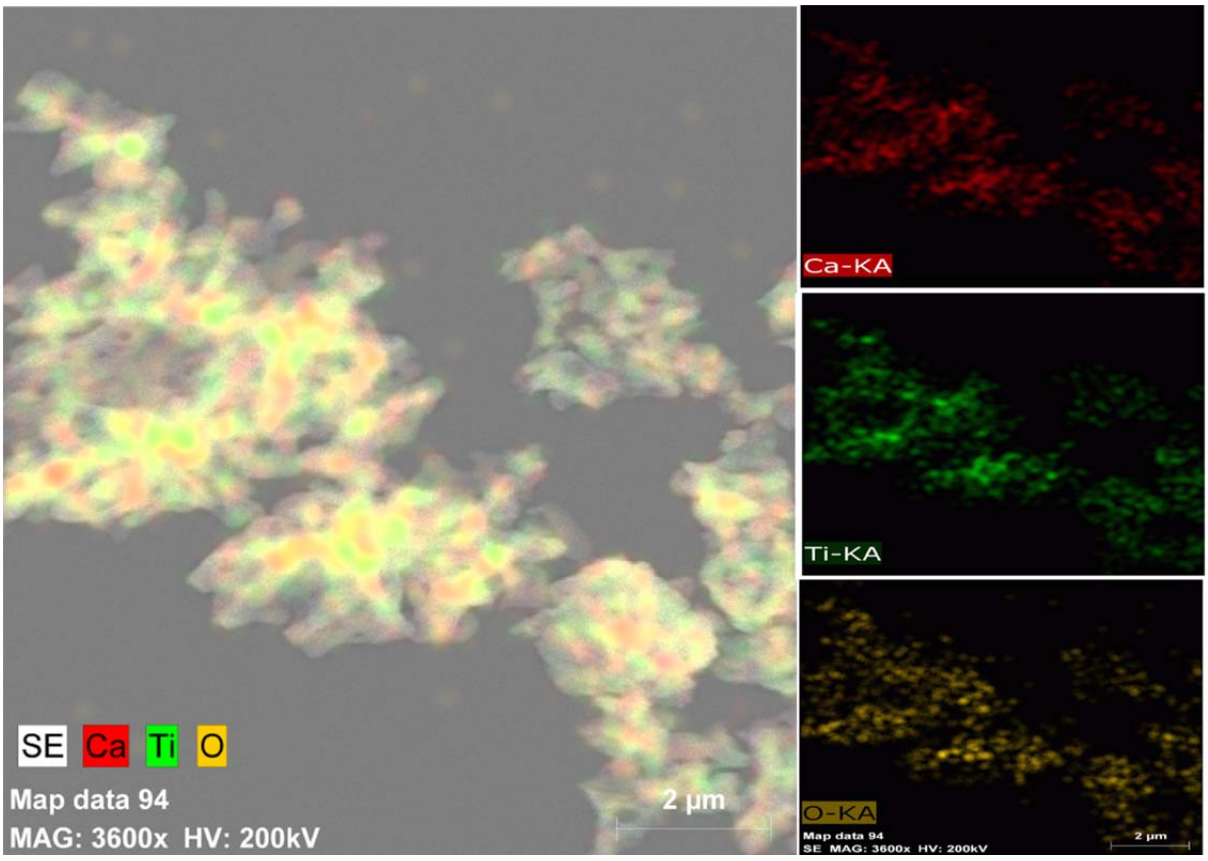

Figure S3. Elemental mapping of CT nanoflakes.

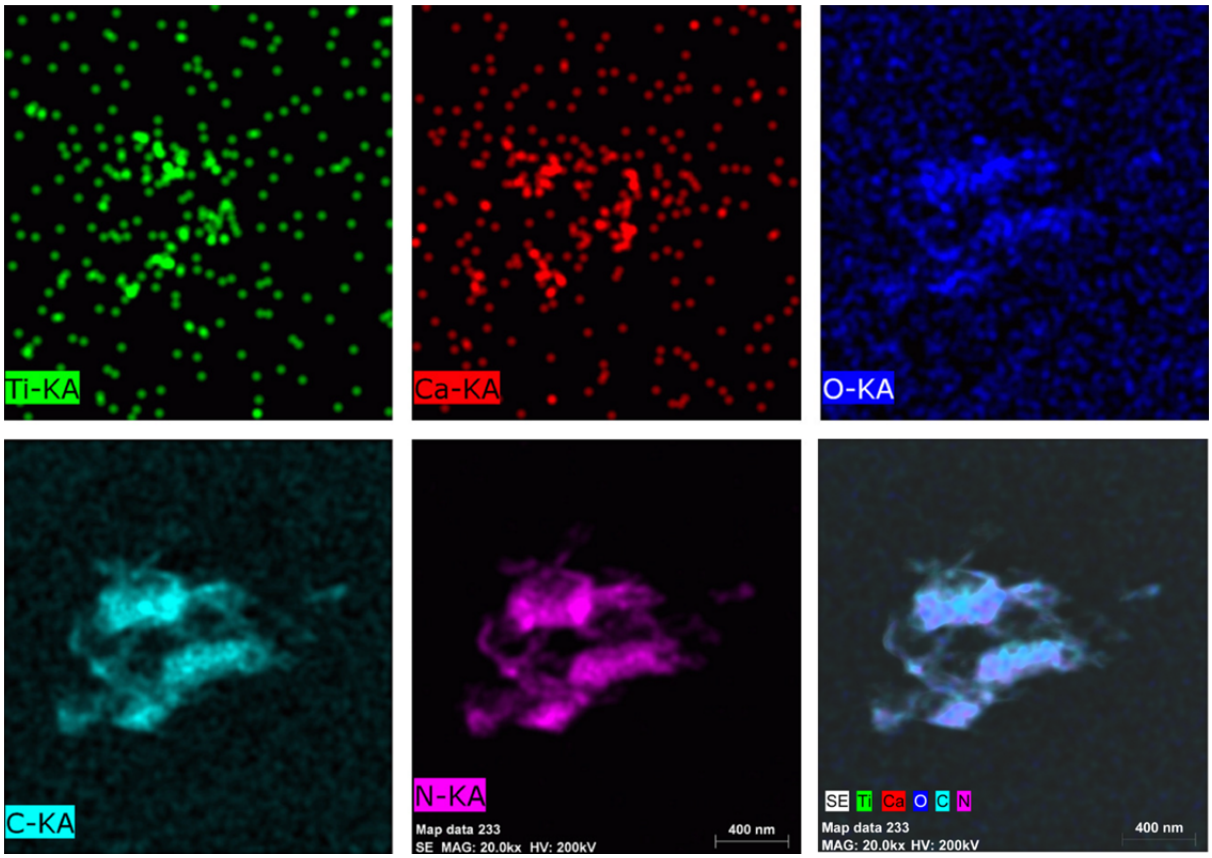

Figure S4. Elemental mapping of CTCN hetrojunction.

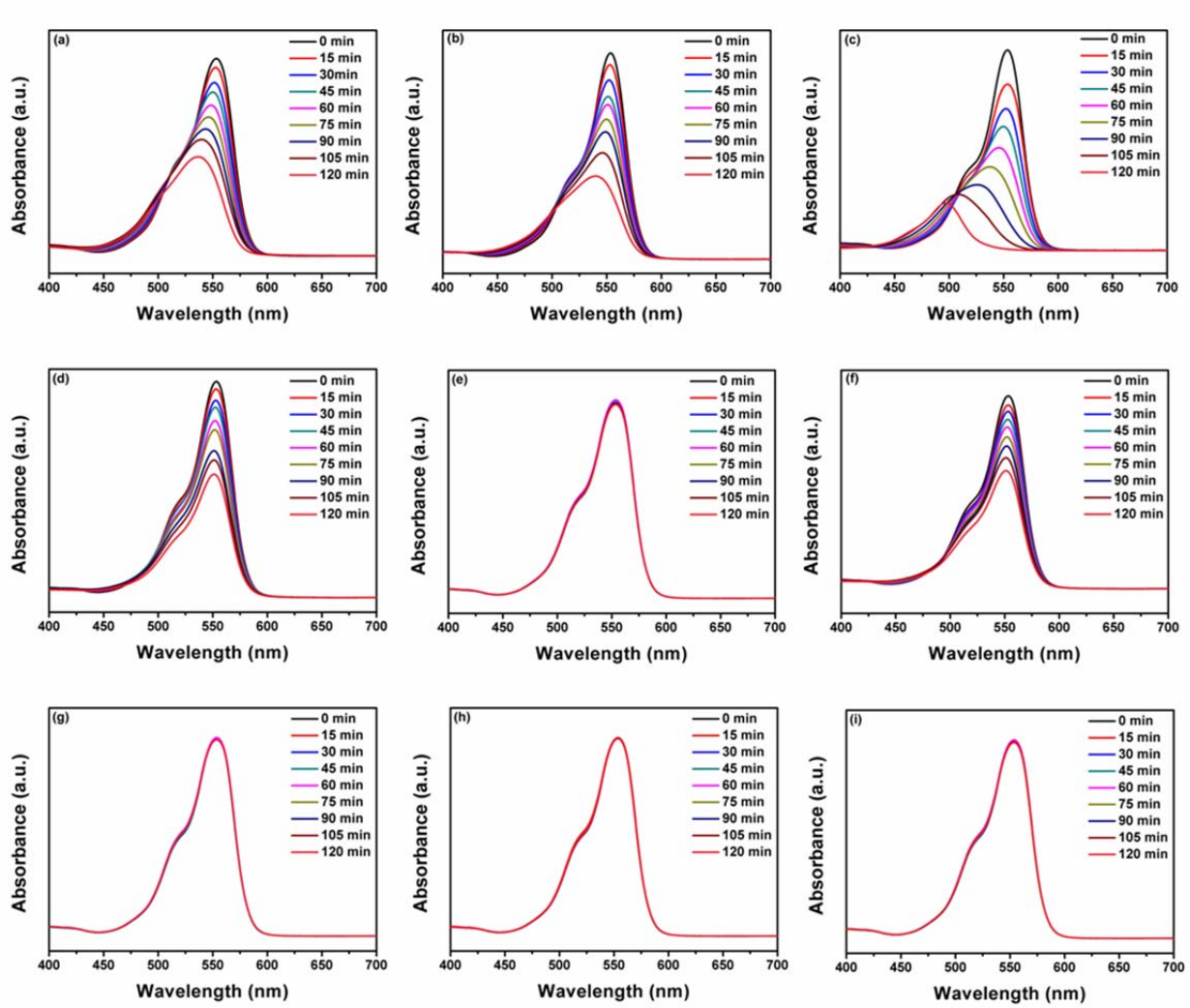

Figure S5. Time-dependent absorption spectra of RhB degradation over (a, b, c) g-C_3N_4, (d, e, f) CT and (g, h, i) pure RhB (without catalyst) under UV, visible and sunlight irradiations, respectively.

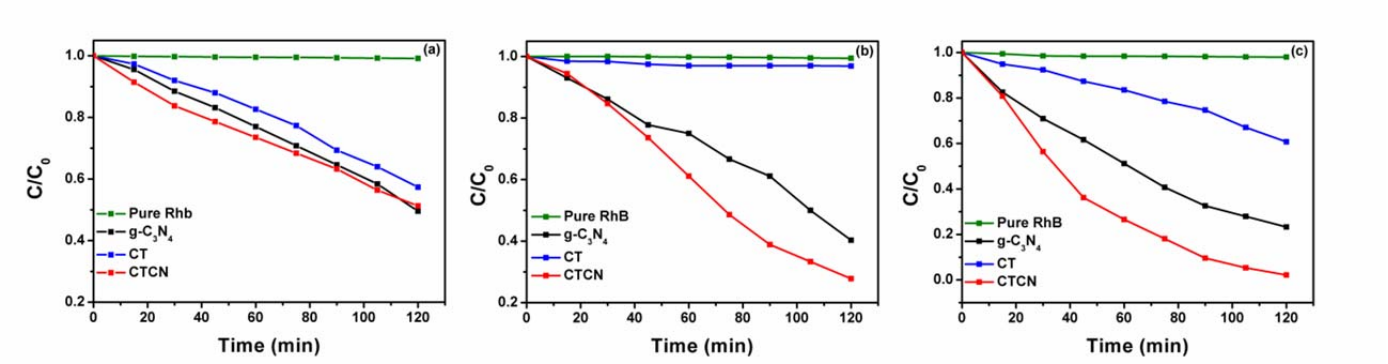

Figure S6. C/C_0 vs time plots for the photocatalytic degradation of RhB under UV, visible and sunlight irradiation**.**

Table S1. Summary of kinetic data obtained by applying pseudo first order kinetic model for the photocatalytic degradation of RhB using as prepared photocatalysts under different light irradiations.

Under UV light irradiation		
Composite	**Rate constant *k***	**R^2**
g-C_3N_4	5.6 X 10^{-3}	0.97
CT	4.6 X 10^{-3}	0.97
CTCN	5.4 X 10^{-3}	0.99
Under visible light irradiation		
g-C_3N_4	7.0 X 10^{-3}	0.94
CT	0.4 X 10^{-3}	0.98
CTCN	11.4 X 10^{-3}	0.98
Under sunlight irradiation		
g-C_3N_4	12.3 X 10^{-3}	0.99
CT	4.0 X 10^{-3}	0.96
CTCN	30.9 X 10^{-3}	0.96

Table S2. Summary of kinetic data obtained by applying modified Freundlich model for the photocatalytic degradation of RhB using as prepared photocatalysts under different light irradiations.

Under UV light irradiation		
Composite	**Rate constant *k***	**R^2**
g-C_3N_4	2.2 X 10^{-3}	0.99
CT	1.4 X 10^{-3}	0.99
CTCN	9.4 X 10^{-3}	0.99
Under visible light irradiation		
g-C_3N_4	4.6 X 10^{-3}	0.99
CT	0.4 X 10^{-3}	0.97
CTCN	2.1 X 10^{-3}	0.99
Under sunlight irradiation		
g-C_3N_4	24.1 X 10^{-3}	0.99
CT	1.3 X 10^{-3}	0.98
CTCN	29.2 X 10^{-3}	0.96

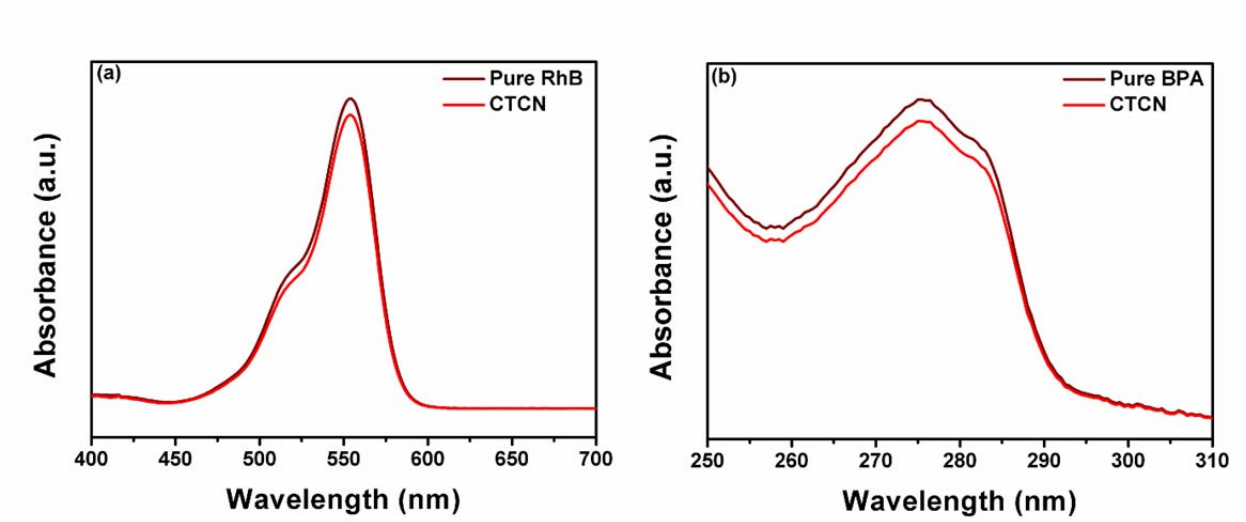

Figure S7. Absorption spectra for calculation of adsorption percentage of (a) RhB over CTCN and (b) BPA over CTCN heterojunction.