**SUPPLEMENTARY INFORMATION**

# Photocatalytic Bactericidal Performance of $LaFeO_3$ under Solar Light: Kinetics, Spectroscopic and Mechanistic Evaluation

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## Characterization of LF nanopowder

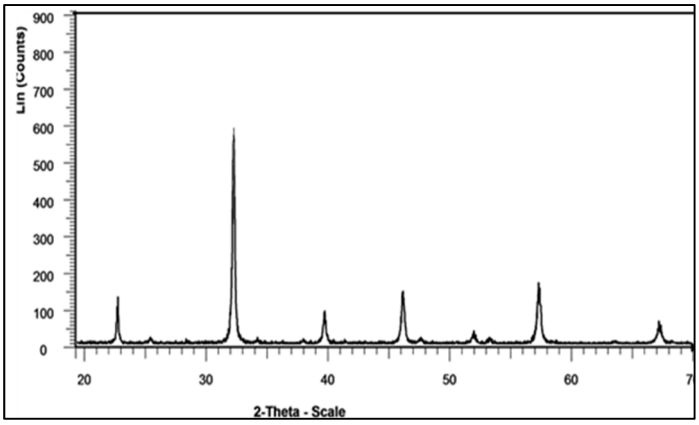


Figure S1. Powder XRD pattern of orthorhombic LF.

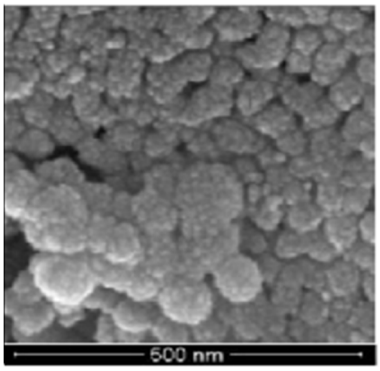


Figure S2. SEM image of LF powder showing the morphology.

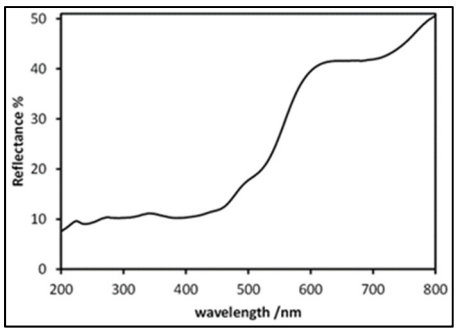


Figure S3. Diffuse reflectance plot of LF powder.

$LaFeO_3$ is photoactive at wavelength up to 600 nm in the visible region. The Kubelka-Munk function $F(R_\infty)$ was used to analyze the diffuse reflectance spectrum of the sample:

$$F(R_\infty) = \frac{(1 - R_\infty)^2}{2R} = \frac{\alpha}{s}$$

where $R_\infty$ is the reflectance, $\alpha$ is the absorption coefficient and $s$ is the scattering factor.

Since $s$ does not change appreciably with wavelength of the incident light, $F(R_\infty)$ is a pseudo-absorption function~$\alpha$. The optical band gap energy was estimated assuming a direct allowed transition in agreement with previous studies on lanthanum orthoferrites [23,55]. The optical band gap energy is determined as 2.5 eV.

## References

[23] Natali Sora, I.; Fontana, F.; Passalacqua, R.; Ampelli, C.; Perathoner, S.; Centi, G.; Parrino, F.; Palmisano, L. Photoelectrochemical properties of doped lanthanum orthoferrites. Electrochim. Acta 2013, 109, 710-715.

[55] Köferstein, R.; Jäger, L.; Ebbinghaus, S.G. Magnetic and optical investigations on $LaFeO_3$ powders with different particle sizes and corresponding ceramics. *Solid State Ionics* 2013, *249-250*, 1-5.