Electronic Supplementary Material (ESI) for RSC Advances.

Electronic Supplementary Information

for

Nanostructured charge transfer complex of $CuTCNQF_4$ for efficient photo-removal of hexavalent chromium

Duong Duc La, [a] *Rajesh Ramanathan,*[b*] *Anushri Rananaware,*[a] *Vipul Bansal,* [b*] *and Sheshanath V. Bhosale*[a*]

[a]School of Science, RMIT University, GPO Box 2476, Melbourne VIC 3000, Australia

[b]Ian Potter NanoBioSensing Facility, NanoBiotechnology Research Laboratory, School of Science, RMIT University, GPO Box 2476, Melbourne VIC 3000, Australia.

[*]Email: rajesh.ramanathan@rmit.edu.au; sheshnath.bhosale@rmit.edu.au, vipul.bansal@rmit.edu.au

Phone: +61 3 9925 2121; Fax +61 3 9925 3747

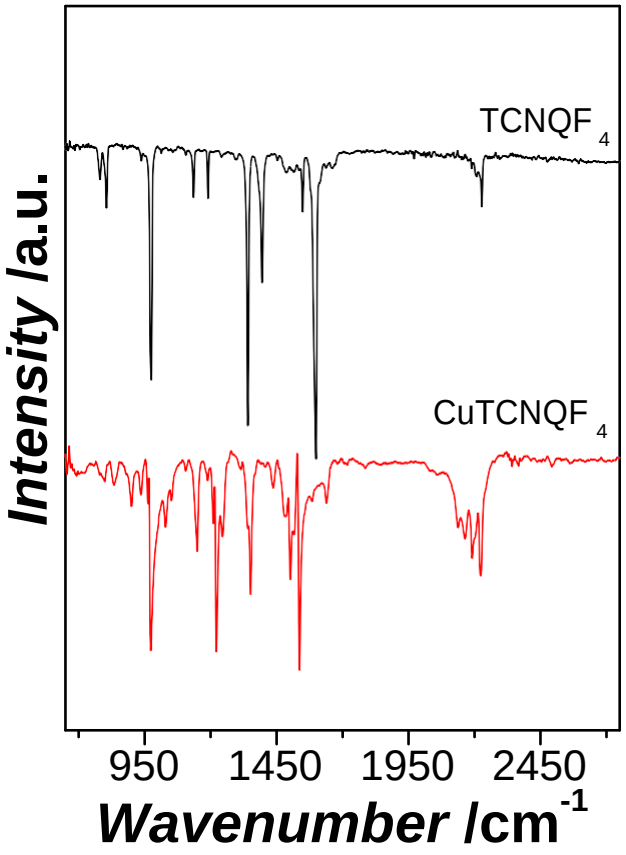

Fig S1. FTIR spectra of pristine $TCNQF_4$ and $CuTCNQF_4$ obtained after the reaction of Cu foil with $TCNQF_4$ in acetonitrile.

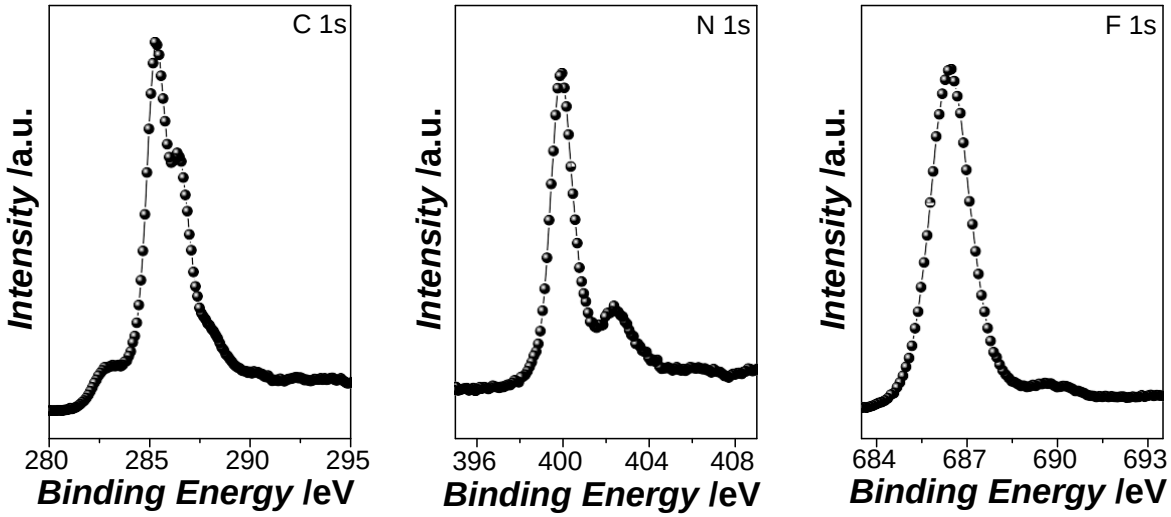

Fig S2. XPS spectra of pristine $TCNQF_4$ powder showing C 1s, N 1s and F 1s core levels.

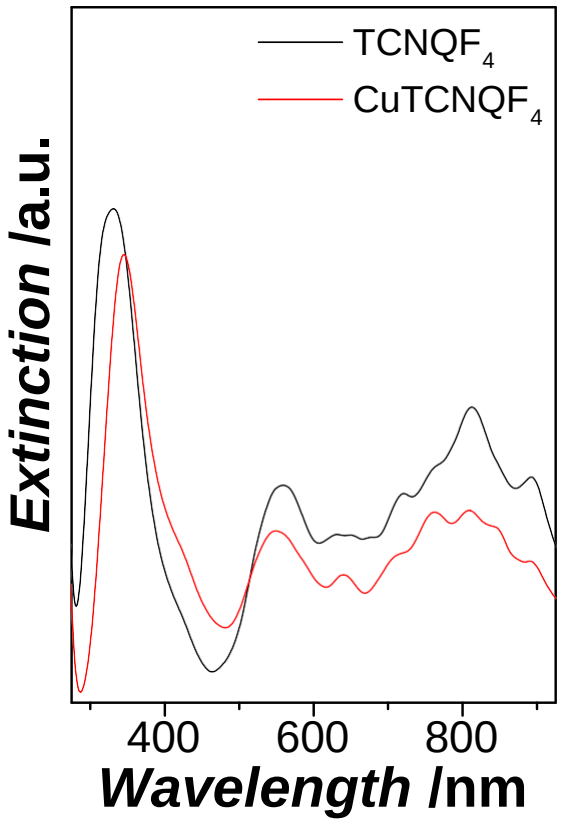

Fig S3. Diffuse reflectance spectra of pristine $TCNQF_4$ and $CuTCNQF_4$ grown on Cu foil.

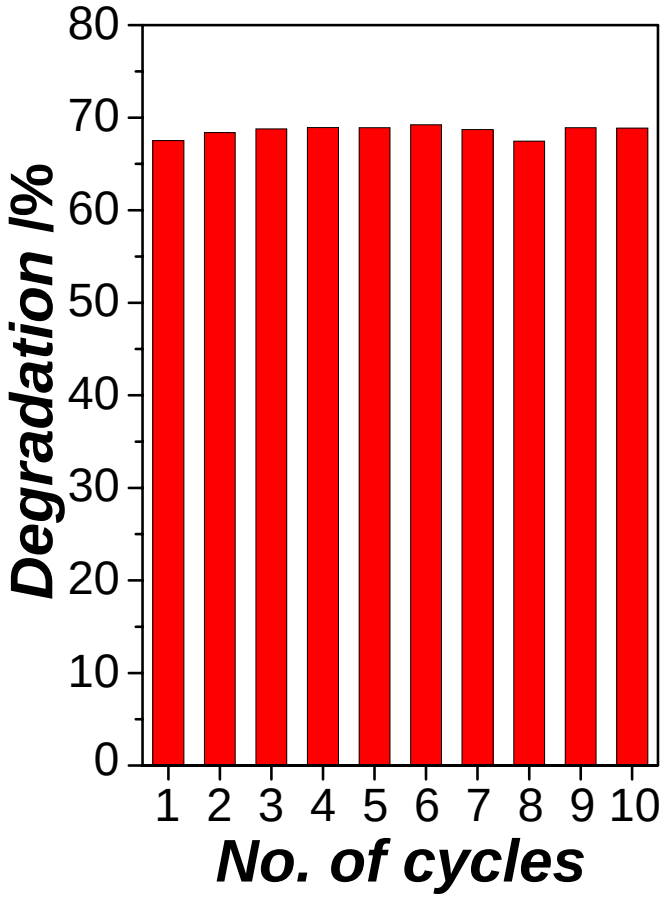

Fig S4. Plot of the percentage reduction of Cr^{6+} under UV light irradiation for 30 min by $CuTCNQF_4$ over multiple cycles.

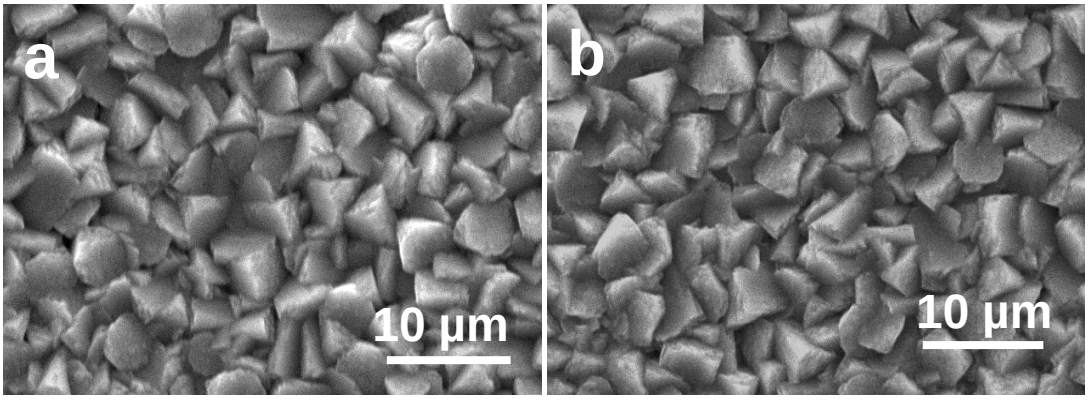

Fig S5. SEM image of $CuTCNQF_4$ obtained (a) before and (b) after the catalytic reaction.

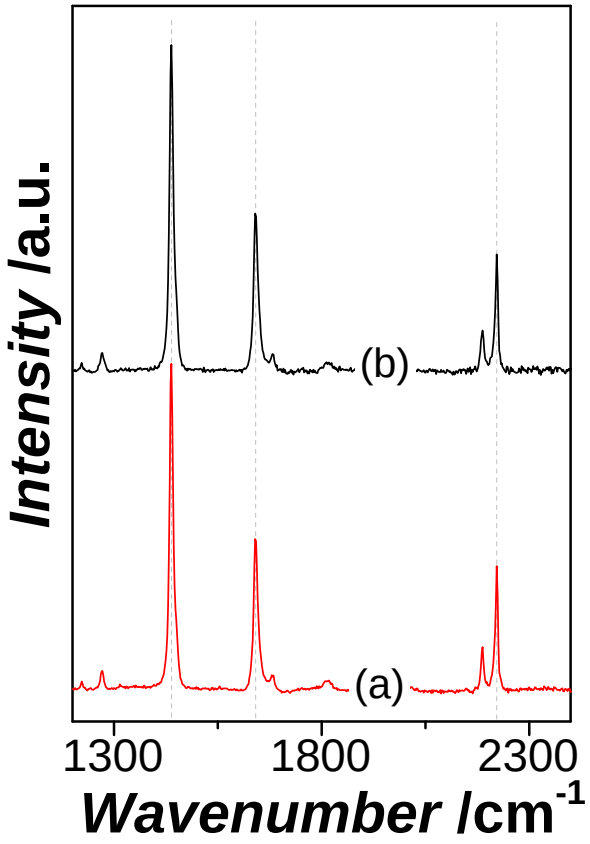

Fig S6. Raman spectra of $CuTCNQF_4$ obtained (a) before and (b) after the catalytic reaction.

Table S1. Rates of reduction of Cr^{6+} ions under different reaction conditions.

Reaction conditions	Reaction rate (min^{-1})
pH 2 / **No donor** / 25 °C / Dark $CuTCNQF_4$	4.8×10^{-4}
pH 2 / **Methanol** / 25 °C / Dark $CuTCNQF_4$	2.5×10^{-3}
pH 2 / **Acetic acid** / 25 °C / Dark $CuTCNQF_4$	2.0×10^{-3}
pH 7 / Methanol / 25 °C / Dark $CuTCNQF_4$	8.2×10^{-4}
pH 3 / Methanol / 25 °C / Dark $CuTCNQF_4$	3.5×10^{-4}
pH 2 / Methanol / 25 °C / Dark $CuTCNQF_4$	2.5×10^{-3}
pH 1 / Methanol / 25 °C / Dark $CuTCNQF_4$	2.4×10^{-3}
pH 2 / Methanol / **5 °C** / Dark $CuTCNQF_4$	6.1×10^{-4}
pH 2 / Methanol / **25 °C** / Dark $CuTCNQF_4$	2.5×10^{-3}
pH 2 / Methanol / **50 °C** / Dark $CuTCNQF_4$	2.3×10^{-3}
pH 2 / Methanol / 25 °C / **Control – No catalyst**	7.6×10^{-4}
pH 2 / Methanol / 25 °C / **Dark $CuTCNQF_4$**	3.4×10^{-3}
pH 2 / Methanol / 25 °C / **UV $CuTCNQF_4$**	3.6×10^{-2}