Supporting Information

Light-modulated colour transformation in highly intertwined vertically growing silver tungstate tubes

Vipul Kirtikumar Patel,[a] Balanagulu Busupalli[a*]

[a] Department of Chemistry, School of Energy Technology, Pandit Deendayal Energy University, Gandhinagar, Gujarat 382426, India.

*E-mail: busupalli.balanagulu@sot.pdpu.ac.in, baalanaagulu@gmail.com

INDEX

A. Supporting Information Figures

A. Supporting Information Figures

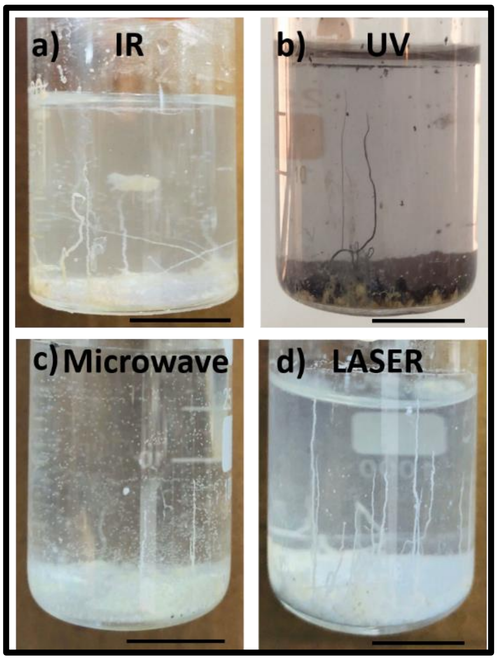

Figure S1. Camera images of the reaction vessels kept in a) IR, b) UV, c) Microwave and d) Laser light conditions. Scale bar for Figure S1 a) (▬ =2.7 cm.) and for Figure S1 b), c), d) is (▬ =2.5 cm.)

Temperature change in the sample before and after the irradiation

No.	Irradiation	Temperature of the reaction vessel before irradiation	Temperature of the reaction vessel after irradiation
1.	IR	29.9° C	71.6° C
2.	UV	29.9° C	33.1° C
3.	Microwave	29.9° C	32.7° C
4.	Laser light	29.9° C	30.8° C

Temperature changes of the sample before and after were measured using ACETEQ Infrared Thermometer Model MT-4.

Infrared lamps emit electromagnetic radiation in the form of infrared light, which, when focused on a solution, can be absorbed by its molecules, leading to an increase in their kinetic energy and a rise in temperature due to the acquired heat energy. That's why under IR irradiation, temperature of the reaction vessel is more compared to other irradiations.

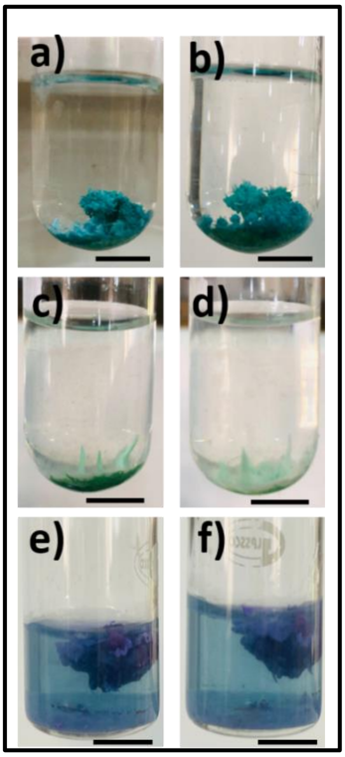

Figure S2. Camera images of the reaction vessels kept under light and dark conditions for different metal ion containing chemical gardens such as a) light, b) dark copper tungstate chemical garden. c) light, d) dark nickel tungstate chemical garden. e) light, f) dark cobalt tungstate chemical garden. Scale bar for Figure S2 a), b), c), d), e) and f) is (▬ =1.3 cm.)

The light and dark induced growth phenomenon was also extended to other chemical gardens such as copper tungstate, nickel tungstate and cobalt tungstate chemical gardens. In these chemical gardens, there were no difference observed in number as well as colour of tubes as shown in Figure S2 a), b) c), d), e) and f).

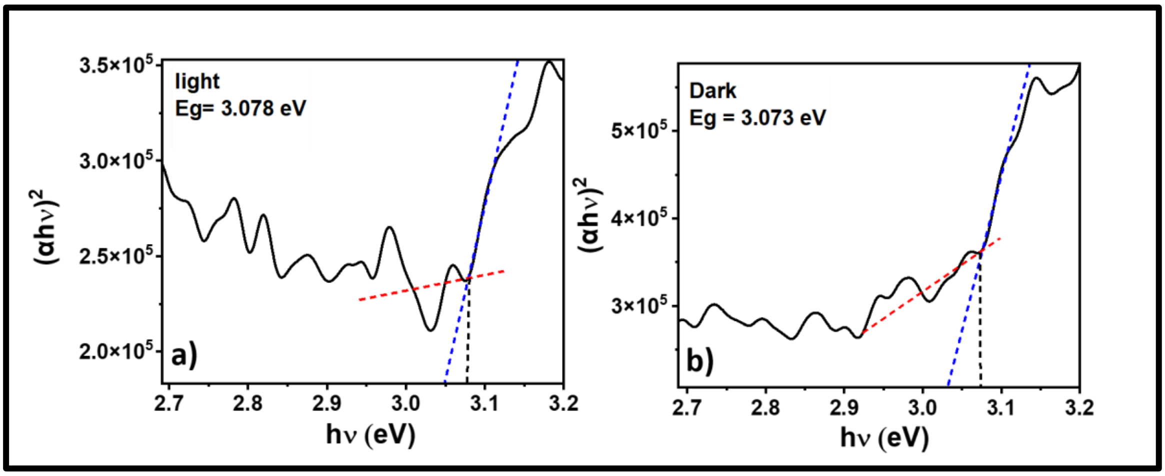

Figure S3. Tauc plots of the silver tungstate chemical garden grown under light and dark conditions. Where a) represents Tauc plot for light grown silver tungstate chemical garden and b) represents Tauc plot for dark grown silver tungstate chemical garden

The solid-state UV spectra of silver tungstate chemical garden obtained from the light and dark reactions are depicted in Figure S3 a-b. The direct optical band gap is generally measured by extrapolating the linear region of the square of the absorption curve to the x-axis, and Tauc proposed a variation of this method. The band gaps (Eg) of silver tungstate chemical gardens formed in light and dark conditions were found to be nearly similar at 3.078 eV and 3.073 eV respectively, revealing the insulating nature of both the light and dark grown samples.

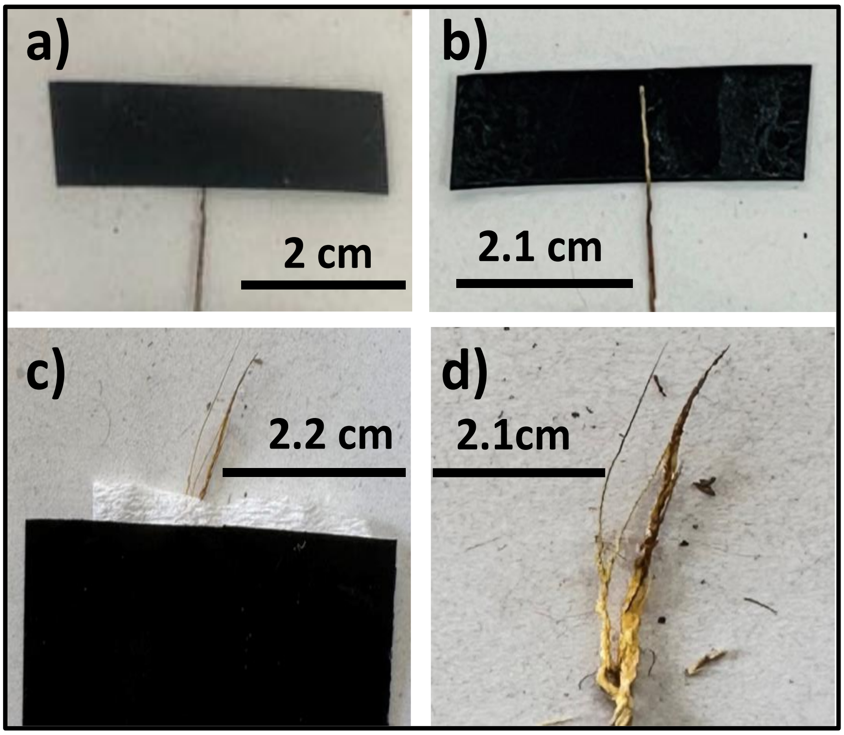

Figure S4. a) camera image of the dark grown tube, covered with black tape and exposed to light. b) camera image of the dark grown tube after removal of the black tape. c) camera image of the dark grown tube (grown in 0.25ml of 0.025 M $KMnO_4$ solution) covered with black tape. d) camera image of the dark grown tube (grown in 0.25ml of 0.025 M $KMnO_4$ solution) after removal of the black tape.