Abstract Submitted
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Advanced Nano-Photonics for Chemical and Biological Detoxification in Potable Water.[1] ARTHUR MALANGA, DIEFF VITAL, ERIC VICKERS, MELBA HORTON, Florida Polytechnic University, ROBERT DUTHIE, Synergena Inc., SESHA SRINIVASAN, Florida Polytechnic University — In this research project, we have studied the feasibility of utilizing the Synergistic Isogeneous Active Decontamination nano-photonic technology for the remediation of toxic micro-organisms and chemicals (e.g. Phenol) in the processed water. Micro-organism Reduction is a new method using specified wavelengths from a single or combined sources that are not solely dependent on breaking the DNA chain within the cell. Micro-organism Reduction which utilizes ultraviolet wavelengths other than the traditional germicidal 253.7 nm. (UV-C). Riboflavin (B2) occupies all cells including harmful micro-organisms. Riboflavin will absorb light at 220.0-225.0 nm, 266.0 nm, 371.0 nm, 444.0 nm, and 475.0 nm. The nano-photonics produced by Riboflavin absorption at these wave lengths produce free radicals in the electron transport which cannot replicate. The free radicals formed from the nano-photonic activity disrupts cellular metabolic activity, structure and protein functions resulting in cell termination. Nano-photonic micro-organism reduction or photo-oxidation of toxic chemical such as Phenol could be processed via solar PV which is an efficient and alternative energy system.

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