



## Energy and Clean Technology

### Problem

Aniline and its derivatives are widely used as raw and intermediate chemicals in the production of isocyanates, rubbers, dyes, and polyurethane resins. Due to its high toxicity, wastewater containing aniline has detrimental effects on public health and aquatic species in the environment.

### Technology

We have developed a novel solar-driven process to remove aniline contaminants from wastewater *via* a redox reaction. This reaction can achieve several outcomes:

1. Removal of toxic aniline and its derivatives from process wastewater.
2. Polymerises the aniline into the higher value conductive polymer polyaniline (priced at \$120 to \$14,160 per kg depending on purity).
3. Produces high purity 'green' hydrogen gas as a by-product.

Further advantages of this process include the (1) relatively low energy utilization required for the solar-driven redox process, (2) elimination of expensive membranes or separators (otherwise required in water splitting) as PAN is a solid product, (3) lower cost of manufacture of polyaniline compared to the traditional synthetic method, and (4) green process with zero CO<sub>2</sub> emission.

### Development

This technology was developed by Prof. Anita Ho-Baillie and Dr. Hongjun Chen; and is currently at TRL 4 – lab validated.

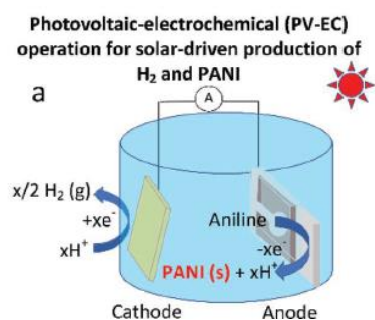
### Commercial Opportunity

This technology is a new advance in wastewater treatment which presents new opportunities for:

- The removal of aniline and derivative contaminants from wastewater for isocyanate and polyurethane manufacturers.
- Value-add by (1) producing high-value products from waste aniline, (2) improving organizational circular economy *via* reuse of aniline waste, and (3) cleaner wastewater effluents for regulatory compliance.
- Co-located water treatment of aniline contaminants, as well as the low-cost production of polyaniline (CAGR 6.8%) and hydrogen fuel (CAGR 54%).

### Intellectual Property Status

This technology is the subject of a PCT application: PCT/AU2022/051139



### Contact Us

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