

# Technology Licensing Opportunity

Non-Confidential Summary



## **GREEN CHEMISTRY FOR GOLD RECOVERY From Secondary Sources and Electronic Scrap ROI# 14-010**

### ***Opportunity:***

The researchers have developed a promising new technology which is highly effective for extracting gold from secondary sources (electronic scrap, jewelry). This process takes place at room temperature and pressure, and replaces aqua regia, cyanide and pyrometallurgical (smelting) techniques.

### ***Background:***

The world's annual gold production in the mining industry is 3200 tonnes, in addition gold recovery from secondary sources is 1100 tonnes and growing. This technology is designed to selectively leach gold and is applicable for recovery of gold from both primary and secondary sources. Electronic devices consume around 10% of the annual gold production (~ 300 tonne/year) and due to lack of a suitable recycling technique, only 25% of gold and other precious metals are recycled from e-wastes each year.

### ***Invention:***

Gold can be rapidly leached from sources (jewelry, printed circuit boards, connectors, etc.) during the recycling process using this University of Saskatchewan technology. The leach solution including low concentrations of an acid and oxidant. The gold leaching step is extremely fast, for example gold is stripped out from printed circuit boards in less than 1 min (see linked video). Furthermore, this process is highly selective for gold over base metals so that the pregnant solution will contain over ~ 60% gold with smaller amounts of Ni Cu, and other base or precious metals depending on the source. In the case of treating typical printed circuit boards (PCBs). This high selectivity makes it possible to treat over **60 kg** of typical gold-containing PCBs with only **one litre** of our solution before it becomes saturated.

### ***Benefit:***

Gold can be stripped quickly and efficiently from typical gold-containing sources at room temperature and with an environmentally benign process. This technology is much cheaper, safer and faster than the current recovery processes, and can be operated at a small scale with a plant set up near the sources of gold to be processed.

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## ***Researcher profile:***

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Visiting professor

Research interests:  
Synthetic inorganic chemistry  
Organometallic chemistry  
Homogeneous catalysis

Research interests:  
Extraction technologies,  
MSc based on precious  
metals from copper anode  
slime

Research interests:  
Synthesizing ligands for  
applications in solvent  
extraction

## ***Patent Status:***

US Patent Applications Nos. 61/937926 and 62/114620

## ***Development Stage:***

Success has been demonstrated at the bench. Work is underway to scale the process up to industrial pilot plant scale.

## ***For more information, please contact:***

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