# Non-Noble Metal Based ODC Cathodes for Chlorine Evolution Processes

**INV-13048**
**Inventors**: Urszula Tylus, Sanjeev Mukerjee

## Description

Chlorine generation is one of the most important processes for a chemical industry, as chlorine is a key component for production of many polymers, notably polyvinyl chloride, polyurethanes, and polycarbonates. The existing chlorine generation techniques involve the use of expensive and precious noble metals such as platinum and rhodium. **This invention discloses a novel technique comprising the use of non-noble metal based oxygen depolarized cathodes (ODCs) for HCL recovery and chlorine generation.**

## Value Proposition

The technique:

- Is highly cost effective
- Allows for a reduced CO2 emission
- Allows for use of highly durable and dissolution resistant cathodes as compared to conventional techniques
- Enables a higher electricity saving as compared to conventional techniques
- Involves the use of Fe, Co, Cr and Ni based polymer composites as non-noble analogous catalysts
- Allows for specifically designed active sites, which are immune to anion poisons as compared to conventional techniques
- Allows for formation of robust polymer networks with high selectivity for oxygen reduction ($10^3$ times higher turnover frequency)
- Is associated with a higher resistance to corrosive environment as compared to conventional techniques
- Would be commercially useful for applications such as in chlorine gas recycling in chemical plants as well as in HCL recovery

## Intellectual Property Status

Provisional Application 61/749,650
Provisional Application 61/750,118

## License Status

Available for license

Northeastern University
*Center for Research Innovation*