Centre for Sustainable Chemical Technologies; University of Bath

Project Title:	Catch and Release Catalysis
Lead Supervisor and co-supervisors:	Professor Chris Frost (Department of Chemistry), Dr Paul Murray (PhosphonicS Ltd.), Dr Nicholas Taylor (PhosphonicS Ltd.).
Industrial Partner:	PhosphonicS Ltd.

Project Summary

This project will explore applications of a new material which has a unique mode of action for recycling catalysts, with their ancillary ligands. The developed process supports an aryl bromide to "catch" catalysts that can undergo oxidative addition. The mode of action has been established and the system has unique advantages including: removal and direct recycling of the active catalyst and ligand; Allows tunability through the choice of any suitable catalyst and ligand; The caught catalyst is stable and can be washed with a range of solvents.

The research project will develop key protocols for applications in the catalytic synthesis of pharmaceuticals and fine-chemicals. This will involve collaborative work with chemical engineers and industry to understand the scale up and development of the material in different reactors and applications.

Sustainability issues addressed

Catalytic processes that are designed to recapture both metals and ligands will contribute to the overall sustainability of chemical processes through atom and resource efficiency. Precious metals are a limited resource and the synthesis of ligands is often an energy- and material-intensive process.