



## Durham E-Theses

---

### *Development of nanoparticle catalysts and total internal reflection (TIR) Raman spectroscopy for improved understanding of heterogeneous catalysis*

BINGHAM, LAURA, MARIA

#### How to cite:

---

BINGHAM, LAURA, MARIA (2017) *Development of nanoparticle catalysts and total internal reflection (TIR) Raman spectroscopy for improved understanding of heterogeneous catalysis*, Durham theses, Durham University. Available at Durham E-Theses Online: <http://etheses.dur.ac.uk/12445/>

#### Use policy

---

The full-text may be used and/or reproduced, and given to third parties in any format or medium, without prior permission or charge, for personal research or study, educational, or not-for-profit purposes provided that:

- a full bibliographic reference is made to the original source
- a [link](#) is made to the metadata record in Durham E-Theses
- the full-text is not changed in any way

The full-text must not be sold in any format or medium without the formal permission of the copyright holders.

Please consult the [full Durham E-Theses policy](#) for further details.

## Acknowledgements

I would like to thank the following people for their help and support over the course of my PhD:

My supervisor Dr Simon Beaumont, for your guidance, and patience which has helped me to strengthen a great many skills (chemistry and otherwise).

All of the technical services teams at the university, in particular Dr Budhika Mendis, and Leon Bowen in electron microscopy, Dr Emily Unsworth in elemental analysis, and Dr Li Li and the team in the Integrated Chemical Reaction Facility, and the glassblowing, electrical and mechanical workshops.

The Dyer and Bain groups for their technical expertise, the lending of copious amounts of glassware, and their companionship.

All my colleagues, friends old and new, particularly Katie, Stephen, and Leah, for the tea breaks, phone calls, and laughter without which I know this would not have been possible.

Finally for Ben, for your endless patience and love.