Diamond's Biggest Outreach Project: 1000 Samples, 100 Schools, 1 Great Big Experiment

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Project M [1] is a large outreach project conducted by Diamond Light Source, designed to engage secondary school students in a real science experiment, investigating calcium carbonate formation, and exploit the high throughput capabilities available at synchrotron beamlines.

100 secondary schools across the UK have made 1000 samples of calcium carbonate, using equipment and resources provided in a project pack. The samples produced have been sent to Diamond in preparation for the diffraction patterns to be collected in a single 24 hour experiment, in April 2017 on beamline I11. The calcium carbonate samples have been synthesised using selected additvies, including amino acids, which will effect the polymorphs of calcium carbonate that are formed (calcite/vaterite) and the lattice parameters of the mineral phases, which will be identified, by stuidents, in the diffraction patterns.

Beamline I11 at Diamond Light Source is a high resolution powder diffraction beamline equipped with automated sample change facilities and a fast diffaction detector [2]. The speed of data collection and sample changover enable 1000 high quality diffraction datasets to be collected from powdered capillary samples in a 24 hour period, yet this feat has not yet been achieved.

Project M has sucessfully engaged more that 2000 students (age 12-18) from all across the UK (from the Shetland Isles to the south coast) that may otherwise be unaware of Diamond Light Source and the research being carried out there. This presentation will describe the aims of the project and present details of the implementation, results and feedback from the project.

[1] http://www.diamond.ac.uk/ProjectM/

[2] Parker et al. (2010) Journal Of Applied Crystallography 44 (1), 102-110.