



μ -Sq Beads

“small things can change the world”

Daniel Lynch

Technical Director – Exilica Limited



Exilica Limited

Formed in 2005 as a university spin-out company

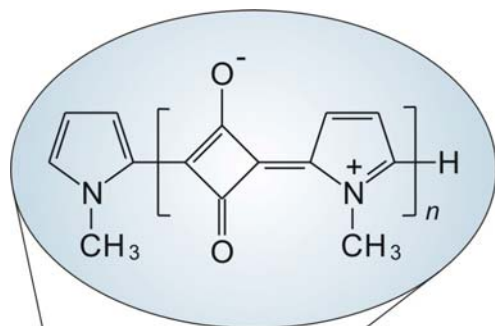
Partly owned by a large multi-national company

Currently involves a team of eight people

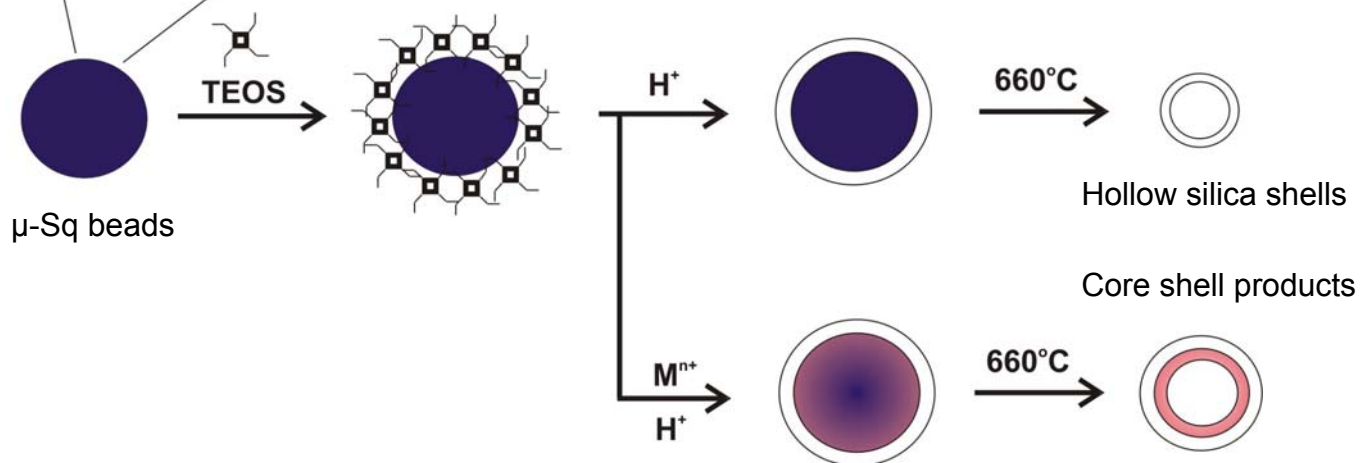
Products

- **μ -Sq beads** - micrometer sized spherical polymer particles
- sub-micrometer sized **Hollow silica shells**
- unique **Core-shell products** are also available

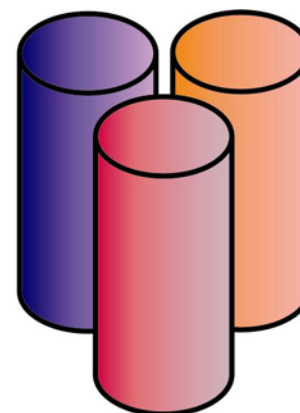
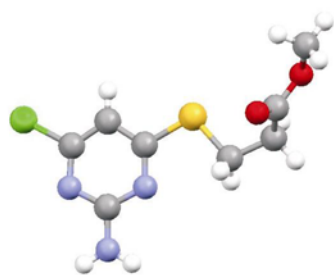
Production methodology



Langmuir (2005) **21**, 6572 - 6575



Applications

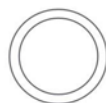


Innovative
products

Novel delivery systems

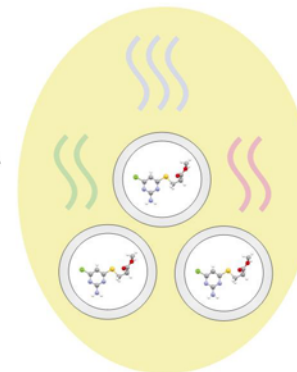


μ -Sq beads

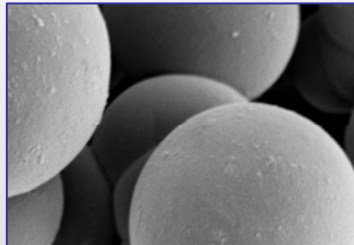
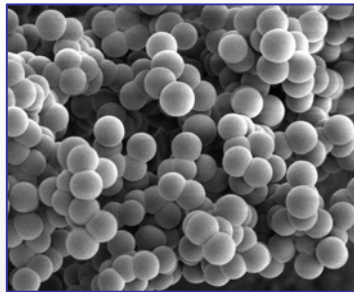


Hollow silica shells

Enhanced
performance



μ -Sq beads parameters

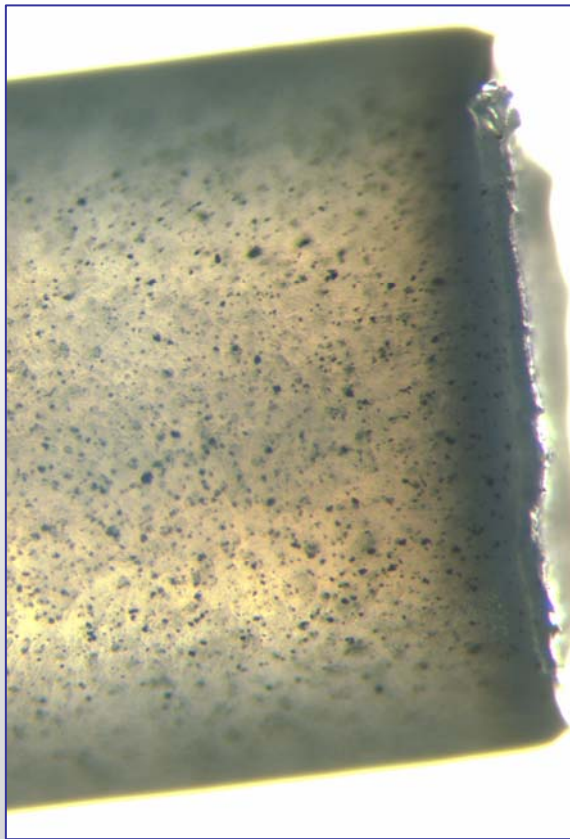


- particle size: 1.3 – 2 μm diameter
- few beads with diameters up to 4 μm
- thermally stable up to 280°C
- mean nominal stress at rupture:
493 \pm 113 MPa
- mean deformation at rupture:
+ 65% initial diameter
- particles are very porous

Porosity - μ -Sq beads



Thermoplastic / rubber additives



Compounding

- easily dispersed
- $\leq 4\%$ w/w in thermoplastics
- $\leq 15\%$ in rubber

Colour considerations

- $\geq 1\%$ colour \rightarrow black
- $< 1\%$ colour \rightarrow grey



Specific areas of commercialisation

**Thermoplastics
&
Rubbers**

Fragrances

- fragrancng environments
- masking chemical odours

Anti-bacterials

- non-silver based
- increased variety



Commercialisation strategy

Direct approach → Automotive company

- 3 year development project
- fragrancng / masking thermoplastics and rubbers
- company specific testing / evaluation

Indirect approach → Proof-of-concept project

- produce marketing samples
- undertake performance testing / evaluation
- establish supply chain



Products to market strategy

Direct approach → Automotive company

- Currently in the final year so both companies will spend the next 9 months tailoring exact product specifications / formulations

Indirect approach

- Products we can arrange through our supply chain
- Joint development products in 'fragranced' plastics
- Value added products in plastics / textiles / rubber via joint development projects