

# OPTIMISE

## Obtaining Pigment-grade Titania In a Molten Inorganic Salt Environment

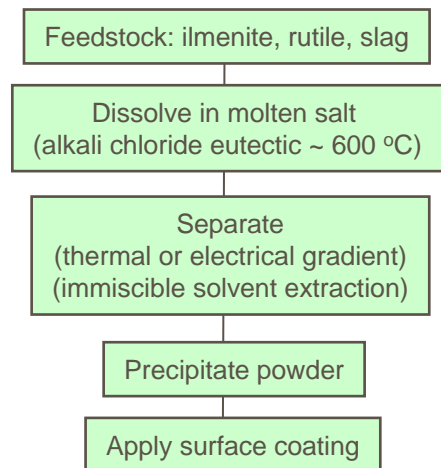


UCL Centre for CO<sub>2</sub> Technology

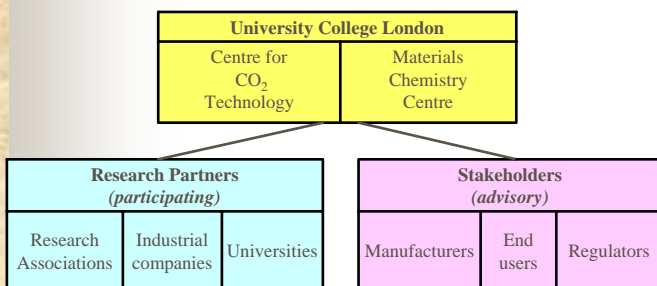
### Summary

- Project aims:- To develop a radical approach to manufacturing chemical products, using reactions in molten salts at low temperature as an alternative to conventional high-temperature processing, with significant economic and environmental gains.
- Selected product:- Manufacture of titanium dioxide selected as an economically and environmentally important example. A successful outcome would enable the technology to be transferred to other products, such as cements and catalysts.
- Indicative process:- Raw materials dissolved in a molten salt at temperatures < 600 °C. Product precipitated as a fine powder of controlled crystallite and particle size.
- Benefits:- Significant reduction in waste, energy consumption and costs. A wider range of raw materials could be accepted from the supply chain and end-users will benefit from enhanced product properties.

### Indicative molten salt process



### Proposed Consortium



### Sustainability gains of a molten salt route

- Simple process accepting a wide range of raw material input, including low quality ores;
- Reduced by-product and waste handling problems, with no hazardous intermediates such as TiCl<sub>4</sub>;
- Lower operating temperatures requiring less process energy;
- Electrically powered process feasible because no combustion step required;
- Control over crystal size and particle size distribution, with no milling required;
- Cheaper, smaller, more versatile plant offering flexible location;
- High performance products such as nano-sized material (catalysts etc.) produced directly;
- Low-grade products manufactured cheaply for less demanding applications.

### Partner skills/expertise/funding sought in:

- Variety of end-user applications, including specialist catalysts and photo-voltaics;
- Molten salt chemistry;
- Large-scale materials and process engineering;
- Product characterisation at micro- and nano-scale.

### Contact details

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