Metalysis
The Lab to Factory Journey
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A Radically Simple Idea

\[ \text{TiO}_2 + 4e^- \rightarrow \text{Ti} + 2\text{O}_2^- \]

\[ \begin{array}{cc}
\text{Ti} & \text{Graphite} \\
\text{CO}_2 & \text{CaCl}_{(liq)}
\end{array} \]
...With a Twist

\[ M_1^{x}O_y + M_2^{x}O_y + M_3^{x}O_y \rightarrow \text{Alloy} \]

- Conventional processing means many alloys are prohibitively expensive due to multiple melt steps and complex forging routes.

- Our use of solid state processing means issues such as liquid immiscibility, differing melting & boiling points and excessive segregation are less problematic.

- New high entropy, or compositionally complex alloy (HEA/CCA) combinations are possible with a wide range of polycrystalline or amorphous structures. These have huge potential in the aerospace, automotive and biomedical fields.
Metalysis has successfully scaled-up the plant size from...At Several Scales...
The Lab To Factory Journey
R&D Scale

For Materials Discovery

- 1\textsuperscript{st} & 2\textsuperscript{nd} Generation Cells
- Our primary research tools
- Grams to kilos of metal product per run
Talking About…

My Generation

- 3<sup>rd</sup> Generation Cells
- Prototype for industrial operation
- 10-20kg of metal product per run
- Two cells operational in a production oriented configuration
- …the difficult third album
Talking About…

My Generation

• 4th Generation Cell
• 100-400kg of metal product per run
• One cell installed, with space for a further cell.
• This is the modular base unit for further expansion.
Launch Products

- Products in the Titanium Alloy Family for the aerospace, automotive & biomedical industries
- Scandium Aluminide master alloys for the aluminium casting and forging industry

Future Products

- Magnet Materials
- High Temperature Materials
- High Entropy / Compositionally Complex Alloys
- Platinum Group Metal Alloys
Future Production Facility…

A two floor production facility with modest power, service and footprint requirements is being designed to provide an optimum mix of throughput and ease of operation.
A Phased expansion plan would be implemented according to market conditions and the available financial support.
Thank You

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