

Johnson Matthey demonstrates key step towards a circular hydrogen economy

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- Johnson Matthey has demonstrated its new **HyRefine™** technology at lab scale for recycling hydrogen fuel cell and electrolyser materials
- Recovering both the critical platinum group metals and membrane ionomer is a key step towards a circular hydrogen economy
- Circularity is essential to conserve precious resources, and minimise the carbon footprint and waste associated with manufacturing fuel cells and electrolysers

A world-first

Johnson Matthey (JM), a global leader in sustainable technologies, today announced the successful lab scale demonstration of its new **HyRefine** technology for recycling hydrogen fuel cell and electrolyser materials. While there are established routes to recycle the platinum group metals (PGMs), often the ionomer isn't recovered. We believe this is the first ever demonstration of circularity for the PGMs and valuable ionomer together.

JM researchers have proven at lab scale that both the PGMs and the ionomer can be recovered and recycled into new catalyst coated membranes - the performance-defining components at the heart of hydrogen fuel cells and electrolysers. Separate experiments have confirmed that the recycled PGM catalysts match the performance of fresh material.

As the hydrogen economy takes off, embedding circularity is critical to conserve precious resources and minimise the environmental impact of manufacturing new hydrogen technologies.

A sustainable offering

Using a purely chemical process, JM's **HyRefine** technology offers efficiency and sustainability benefits compared to conventional PGM refining.

Processing only fuel cell and electrolyser material, JM's bespoke **HyRefine** technology provides additional traceability of the critical PGMs. The output from this process would be 100% secondary (recycled).



Secondary metal has up to a 98% lower carbon footprint than primary (mined) metal, offering significant sustainability benefits¹. The PGM can then be seamlessly integrated into JM's PGM catalyst manufacturing and subsequent CCM manufacturing.

Following successful 5 litre lab scale demonstrations, JM is now scaling up this technology to run 50 litre pilot trials in its facility in Brimsdown, UK.

Alastair Judge, JM's Chief Executive, Platinum Group Metals Services, said: "This demonstration of our **HyRefine** technology is a key step on our path to providing a circular service for our fuel cells and electrolyser customers in the future.

"It's a fantastic example of how we can leverage our foundational PGM ecosystem, world-leading recycling capabilities and decades of expertise in hydrogen technologies and apply this to embed circularity into the hydrogen economy."

ENDS

Johnson Matthey is a global leader in sustainable technologies. For over 200 years we've used advanced metals chemistry to tackle the world's biggest challenges.

Many of the world's leading energy, chemicals and automotive companies depend on our technology and expertise to decarbonise, reduce harmful emissions, and improve their sustainability.

And now, as the world faces the challenges of climate change, energy supply and resource scarcity, we're actively providing solutions for our customers. Through inspiring science and continued innovation, we're catalysing the net zero transition for millions of people every day.

For more information visit www.matthey.com.

For further information

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¹ ["The Life Cycle Assessment of Platinum Group Metals"](#) – International Platinum Group Metals Association