

PGMs ROLE IN THE HYDROGEN ECONOMY

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PGM & HYDROGEN



The Hydrogen Economy refers to the decarbonisation of economic sectors by the use of zero-emission energy production.



Different Hydrogen production methods

Hydrogen is produced using various methods. The techniques used determine the carbon footprint. Hydrogen is not an energy source, but rather an energy carrier that is used to deliver and store significant amounts of energy.

Hydrogen is used in fuel cells to generate electricity and heat, and mostly in refining petroleum.

| Green | Blue | Grey | Brown | Purple | Pink | Red | White |
|---|--|--------------------------------------|--------------------|---|------|------------------------------|-------|
| | | | | | | | |
| Water Electrolysis through renewable energy like solar and wind | Fossil fuels except coal, CO2 stored underground | Fossil fuel, steam methane reforming | Coal gasification | Nuclear power thermal. Purple: Combined chemo thermal electrolysis splitting of water Pink: Electrolysis of water Red: High-temperature catalytic splitting of water | | Naturally occurring hydrogen | |
| Zero CO2 emissions | Low CO2 emissions | High CO2 emissions | High CO2 emissions | Zero CO2 emissions | | Zero CO2 emissions | |

| | | |
|-----------------------|---------------------|-----------------------|
| 44 Ru Ruthenium | 45 Rh Rhodium | 46 Pd Palladium |
| 76 Os Osmium | 77 Ir Iridium | 78 Pt Platinum |

The current role of PGMs in the Hydrogen Economy

- Platinum is used in proton exchange membrane (PEM) applications. This technology is used to unlock the zero-emission potential of hydrogen
- Hydrogen is produced through the electrolysis of water. A combination of Platinum and Iridium is used as a catalyst in PEM electrolysis
- Commercial production of Hydrogen is done at high temperatures and high voltages, Rhodium has very high resilience to extreme temperatures and high voltages, and can be applied in the production of hydrogen.

PGMs unique qualities will play a significant role in the production of hydrogen within the ever-rising demand for a zero-emission hydrogen economy.

Sources:

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