MODULE 3

PODCAST:
CLOSED HYDROGEN CYCLE: INNOVATIONS AND CHALLENGES IN RECYCLING

QUIZ

The quiz consists of 20 questions about fuel cells and their role in logistics. Each question has four answer options, one of which is correct.

Question 1: What is the main method of producing clean hydrogen?
A. Catalysis
B. Water electrolysis
C. Fermentation
D. Distillation

Question 2: What technologies enable modern electrolyzers to operate over a wide range of pressures and temperatures?
A. Proton exchange membranes (PEM)
B. Ion exchange membranes
C. Catalytic water splitting
D. Solid electrolytes

Question 3: Where has PEM electrolysis been integrated with renewable energy sources?
A. Silicon Valley
B. Hydrogen Valley in Denmark
C. Golden Gate Park
D. Green Park in London

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Question 4: What does water electrolysis combined with renewable energy sources enable?
A. Increasing the use of fossil fuels
B. Producing hydrogen without carbon dioxide emissions
C. Increasing greenhouse gas emissions
D. Reducing energy production

Question 5: What technology uses thermal energy to produce hydrogen?
A. Thermochemical water splitting
B. Photocatalytic water splitting
C. Biochemical water splitting
D. Electrochemical water splitting

Question 6: Who conducts research on thermochemical water splitting?
A. Max Planck Institute
B. NASA
C. Fraunhofer Institute in Germany
D. MIT

Question 7: What are the benefits of hydrogen recycling in industry?
A. Increased emissions of harmful substances
B. Reduction in operating costs
C. Increased demand for coal
D. Decreased production efficiency

Question 8: What does Pressure Swing Adsorption (PSA) technology enable?
A. Carbon dioxide absorption
B. Methane production
C. High-purity hydrogen recovery
D. Alcoholic fermentation

Question 9: Which company has integrated PSA technology into its refining processes?
A. Google
B. Shell
C. Tesla
D. ExxonMobil

Question 10: What initiatives does the U.S. Department of Energy have in place to address hydrogen recycling?

A. ARPA-E
B. NASA
C. DOE-Nuclear
D. EPA-Water

Question 11: What do closed cycles enable in the industry in the context of hydrogen?

A. Reusing the same hydrogen
B. Disposable use of hydrogen
C. Increasing CO2 emissions
D. Decreasing energy efficiency

Question 12: What are the challenges of initially installing water electrolysis systems?

A. Low cost
B. Quick installation
C. High initial costs
D. Lack of available materials

Question 13: Why is scaling electrolysis technology complex?

A. It requires low investment
B. It is technologically simple
C. It is expensive and technologically complex
D. It does not require logistics

Question 14: What is needed to overcome barriers to implementing hydrogen technologies?

A. Reduction in investment
B. Both public and private investment
C. Government regulation only
D. Elimination of all investment

Question 15: What is the future of hydrogen recycling?

A. Promising
B. Pessimistic
C. Uncertain
D. Stagnant

Question 16: What are the benefits of the increasing demand for sustainable technologies?

A. Increasing energy efficiency
B. Increasing fossil fuel consumption
C. Lowering global temperatures
D. Reducing energy production

Question 17: What does hydrogen enable as an energy carrier?

A. High versatility
B. Low efficiency
C. High production costs
D. High CO2 emissions

Question 18: Where has the adoption of hydrogen technologies been observed?

A. Only in Europe
B. Only in Australia
C. Worldwide
D. Only in the United States

Question 19: What is the main challenge in integrating hydrogen systems with the energy infrastructure?

A. No challenges
B. Simplicity of the process
C. Need to adapt existing systems
D. Lack of available technologies

Question 20: What actions are necessary to achieve hydrogen recycling targets?

A. Joint efforts of governments, businesses, and scientific institutions
B. Reduction in international cooperation
C. Reduction in scientific research
D. Increased production of fossil fuels

ANSWER KEY

1.B / 2.A / 3.B / 4.B / 5.A / 6.C / 7.B / 8.C / 9.B / 10.A / 11.A / 12.C / 13.C / 14.B / 15.A / 16.A / 17.A / 18.C / 19.C / 20.A

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