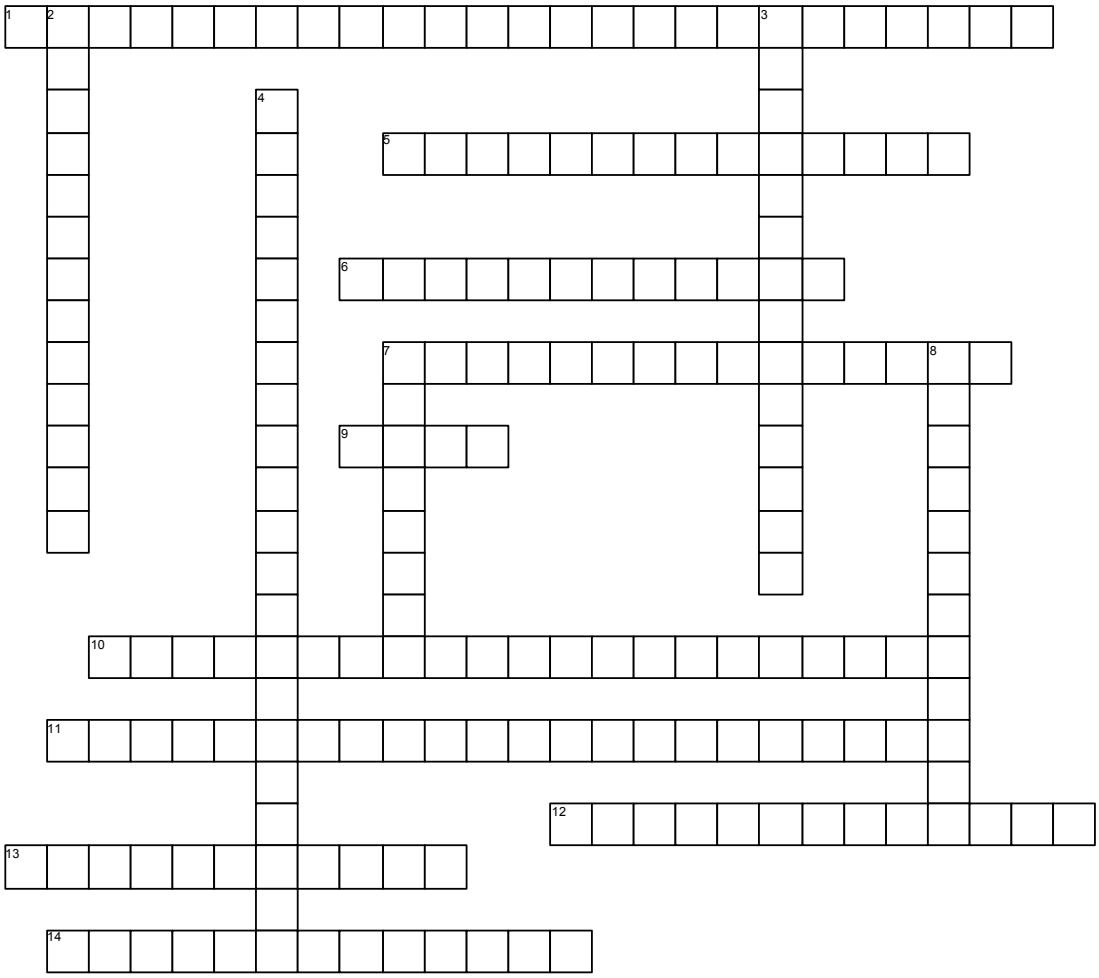
Fuel Cells And Advanced Technologies

Chapter 32



http://jameshalderman.com

ACROSS

1 The part of the PEM fuel cell that contains the membrane, catalyst coatings, and electrodes is known as the _____ _____ _____.
5 Hybridization tends to increase efficiency in vehicles with conventional drive trains, as energy that was once lost during braking and otherwise normal operation is instead stored for later use in a high-voltage battery or _____.
6 The chemical reaction in a fuel cell is the opposite of _____.
7 A ____-____ _____ uses the fuel cell as its only source of power.
9 The Proton Exchange Membrane fuel cell is also known as a ____.
10 A _____-____ _____ _____ would also have an electrical storage device that can be used to power the vehicle.
11 The fuel-cell design that is best suited for automotive applications is the _____ _____ _____.
12 It is more common for hundreds of fuel cells to be built together in a ____-____ _____.
13 There are a number of different types of fuel cells, and these are differentiated by the type of _____ that is used in their design.
14 Hydrogen is only an _____ _____, as energy must be expanded to generate the hydrogen and store it so it can be used as a fuel.

DOWN

2 Methanol has a higher _____ _____ than gaseous hydrogen because it exists in a liquid state at normal temperatures, and is easier to handle since no compressors or other high-pressure equipment is needed.
3 Hydrogen is an excellent fuel because it has a very high _____ _____ when compared to an equivalent amount of fossil fuel.
4 Ultracapciator cells are based on _____-_____ _____, in which two activated-carbon electrodes are immersed in an organic electrolyte.
7 A _____ _____ is an electrochemical device in which the chemical energy of hydrogen and oxygen is converted into electrical energy.
8 One of the major challenges for engineers in this regard is the fact that the heat generated by the fuel cell is classified as ___-_____ ____.