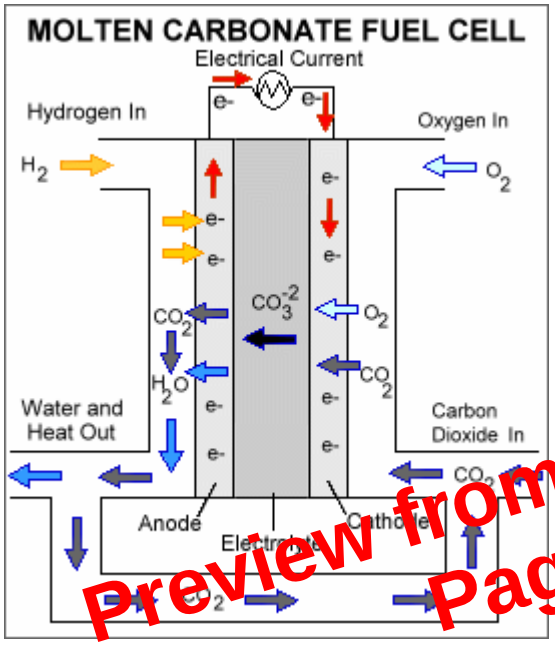
B. *Phosphoric Acid Fuel Cells (PAFC)*

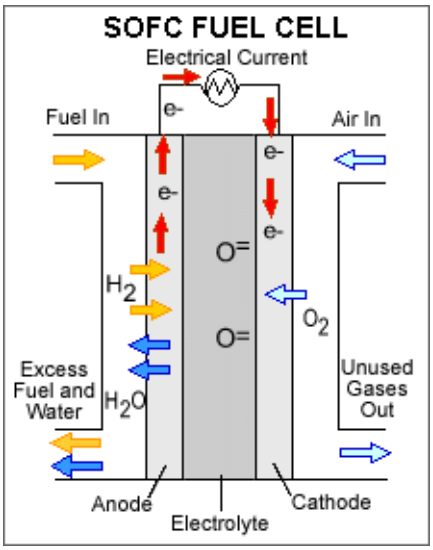
Phosphoric Acid Fuel Cells (PAFC) were the first fuel cells to be commercialized. The PAFC uses an electrolyte that is phosphoric acid (H_3PO_4) that can approach 100% concentration. The charge carrier in this type of fuel cell is the hydrogen ion (H+, proton). This is similar to the PEFC where the hydrogen introduced at the anode is split into its protons and electrons. The protons migrate through the electrolyte and combine with the oxygen, usually from air, at the cathode to form water. The electrons are routed through an external circuit where they can perform useful work. [6]

C. *Molten Carbonate Fuel Cells (MCFC)*



Molten Carbonate Fuel Cells (MCFC) are in the class of high-temperature fuel cells. MCFCs work quite differently from other fuel cells. These cells use an electrolyte composed of a molten mixture of carbonate salts. Two mixtures are currently used: lithium carbonate and potassium carbonate, or lithium carbonate and sodium carbonate. To melt the carbonate salts and achieve high ion mobility through the electrolyte, MCFCs operate at high temperatures (650ºC). [7]

D. *Solid Oxide Fuel Cell (SOFC)*



The Solid Oxide Fuel Cell (SOFC) is currently the highest-temperature fuel cell in development and can be operated over a wide temperature range from 600ºC–1000ºC allowing a number of fuels to be used. As a solid electrolyte, it is impervious to gas cross-over from one electrode to another when liquid electrolytes usually consist of the electrolyte contained in some porous supporting structure. The charge carrier in the SOFC is the oxygen ion (O^{2-}). At the cathode, the oxygen molecules from the air are split into oxygen ions with the addition of four electrons. The oxygen ions are conducted through the electrolyte and combine with hydrogen at the anode, releasing four electrons. [8]

E. *Proton Exchange Membrane Fuel Cells (PEMFC)*