Professor Constantine Balakiryan:

The oxide film is no longer a challenge for the Hydrogen economy

Production of hydrogen by oxidation of active metals, and particularly aluminum and its alloys, is and has been studied by many universities and research centers.

The main problem that scientists are trying to solve is the formation of an oxide film on the surface of the active metals which interrupts oxidation reaction and therefore stops production of hydrogen.

We know that the investigators who used aluminum powder in their research achieved positive results.

But the greatest success achieved in this direction has been the Purdue University scientist under the leadership of Prof. Jerry Woodall. They developed a method that uses an aluminum alloy to extract hydrogen from water for running fuel cells or internal combustion engines. They believe that this technique could be used to replace gasoline.

The method makes it unnecessary to store or transport hydrogen - two major challenges in creating a hydrogen economy, said Jerry Woodall.

They created an aluminum alloy which doesn't become covered by an oxide film and does not interrupt the process of production of hydrogen. Unfortunately, the alloy consists of gallium additives. Therefore, this method cannot reach wide industrial application because of the high cost of gallium.

We chose a different path. The subject of our study was a multi-component solution of the chemical oxidant. As a result of many months and laborious work, we managed to synthesize a solution which not only oxidizes active metal, but also doesn't allow the molecules of oxide to settle on the metal surface. This discovery also led to the process of continual hydrogen production until the complete dissolution (oxidation) of the total mass of the active metal. This is a totally surprising discovery.

This method opens up incredible opportunities for producing hydrogen by reliable and environmentally-friendly ways.

The illustrations below show the dramatization of what takes place when metal is placed in the solution for different time increments.

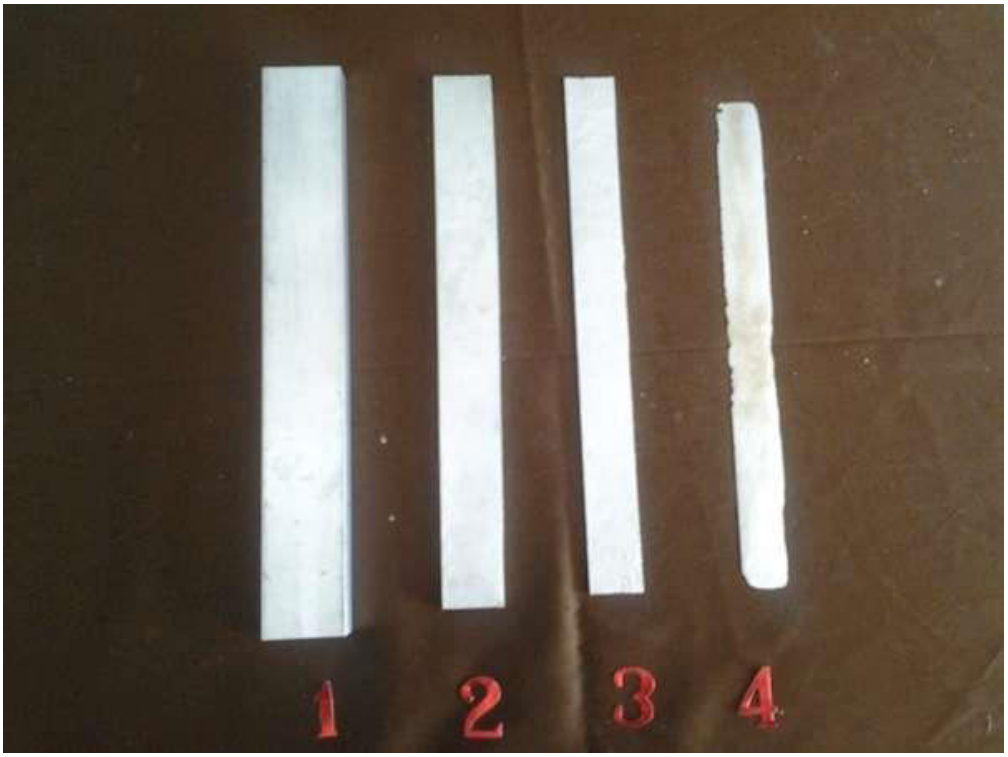
Picture #1 -Four identical plates of (8.9 x 1.22 x 0.5 inches) were cut. With #1 being the control agent , and #2,#3,#4 all being the test.

Picture #2- After 6 hours of stay in solution plates: # 2#3#4 were reduced to (8.71 x 1.1 x 0.41inches)

Picture #3- After 12 hours in solution plates: # 2#3#4 were reduced to (8.52 x 0.94 x 0.25inches)

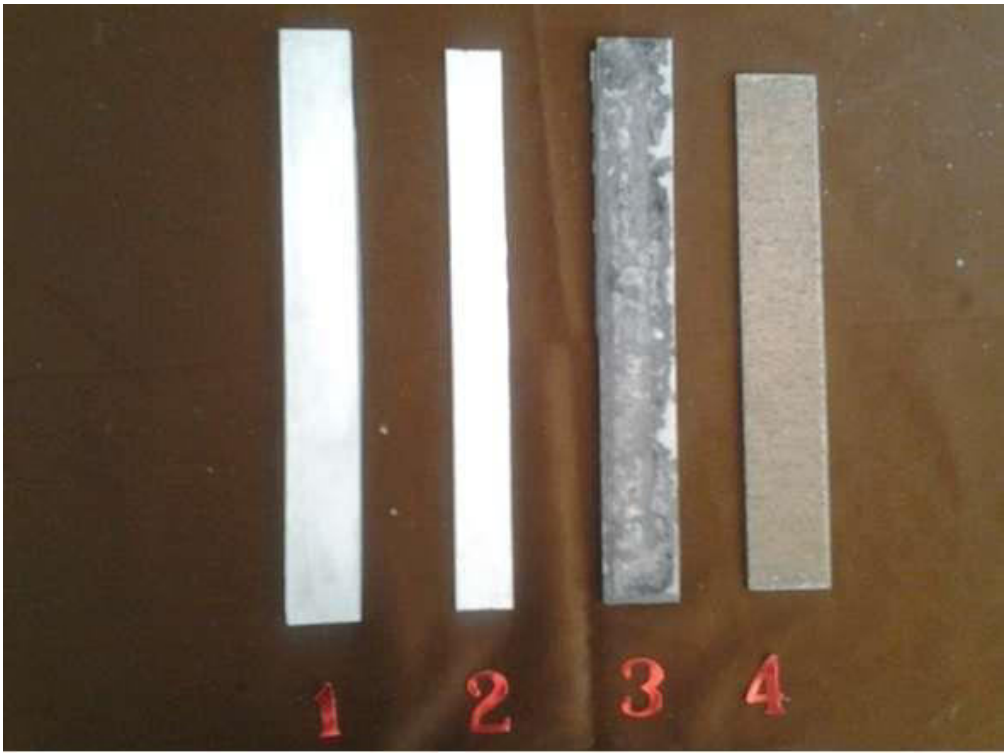
Picture# 4- After 18 hours in solution plates: # 2#3#4 were
Reduced to (7.9 1x 0.79 x 0.03 inches)

Picture#5- note the absolute purity, radiance and lack of oxidation.



Picture# 6- after 24 hours shows all that remained of the plate.

Picture#7- Recalls that after 60-90- minutes in solutions of KOH and NaOH oxide film on plates #3 and # 4 stops the oxidation of the active metal, while plate #2 remains free of oxidation. (#1 is the control agent.)



Application of this technique can modify our way of how we think and produce energy thus allowing us to protect the environment as well a save billions of dollars annually on day to day energy consumption.

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