

UPDATE FROM THE CUTTING EDGE

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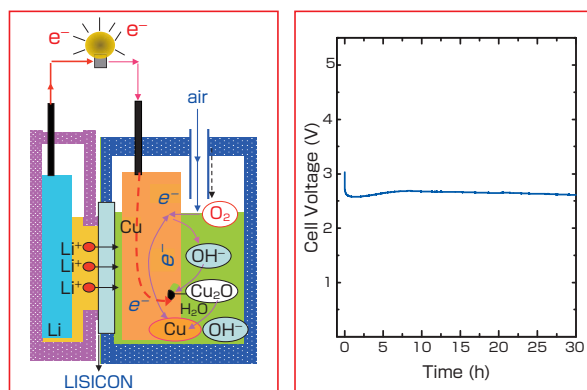
The abstracts of the recent research information appearing in Vol.10 No.7-9 of "AIST TODAY" are introduced here, classified by research areas. For inquiry about the full article, please contact the author via e-mail.

Environment and Energy

A new type of Li-metal air fuel cell

Large capacity and low cost lithium air fuel cell using corrosion phenomenon

We have developed a new type of lithium-copper air fuel cell using the hybrid electrolyte (organic electrolyte/solid electrolyte/aqueous electrolyte). A copper positive electrode is placed in the aqueous electrolyte and metallic lithium is used as a negative electrode in the organic electrolyte. The copper electrode is oxidized by oxygen in the air to generate copper (I) oxide (Cu_2O). Upon discharge, lithium atoms of the negative electrode supply electrons to the wire and dissolve as lithium ions, which go through the solid electrolyte towards the aqueous electrolyte. At the positive electrode, supplied electrons reduce Cu_2O molecules to copper atoms that precipitate on the electrode. After the discharge, copper is oxidized again through copper-corrosion reaction. In this way, oxygen is electrochemically reduced and copper works as catalysts of the oxygen reduction. The developed lithium-copper air fuel cell based on the copper-corrosion reaction shows stable discharge.



(L)The lithium copper air fuel cell based on copper corrosion
(R)The discharge curve of the lithium copper air fuel cell

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