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## Superwetting electrodes for gas-involving electrocatalysis

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Electrochemical gas-involved reactions, including gas-evolution reaction and gas-consumption reaction, are essential parts in current energy conversion processes and industries. Although the exploration of the highly active catalysts has been very mature, less attention was paid on the gas management during the gas-involved reactions. Inspired from bio-inspired materials, scientists find that bio-mimicked electrodes with superwetting property will influence the gas transportation process during the electrochemical reactions. Our group fortunately found that the interface behavior of electrode could be tuned by surface architecture construction, for example, transferring from aerophobic to superaerophobic by engineering a series of superwetting micro/nanostructured electrodes, e.g. $MoS_2$. Cu nanoarray and Pt pine-like films; transferring from aerophibic to superaerophibic by poly(tetrafluoroethylene) (PTFE) modifying. For gas-evolution reaction, constructing nanostructured superaerophobic electrodes is effective to improve the performance by enlarging the bubble contact angle and reducing the bubble adhesion force with the surface of the electrode, thus insuring smooth leaving of the gas products. As to the gas consumption reactions, the superaerophibic electrodes are able to improve the performance by providing an unblocked gas diffusion pathway and a smooth electron transport. Therefore, construction of superwetting surface (supersaerophobic for gas evolution reaction and superaerophobic for gas consumption reaction) can boost the performances of the electrodes by managing the surface bubbles.

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