Water Electrolysis and boiling

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When boiling is superimposed on water electrolysis, the electrolysis voltage decreases abruptly. The authors' group has named this phenomenon the boiling effect [1]. When the water supplied to the anode compartment of a PEMEC (Polymer Electrolyte Membrane Electrolysis Cell) is boiled under controlled cell temperature, the resulting water vapor bubbles can help reduce the concentration of dissolved oxygen gas, leading to a lower Nernst voltage [2–4]. This seminar introduces several experimental results that demonstrate the boiling effect. In addition, it briefly discusses possible mechanisms that may explain this phenomenon.

[1] Kohei ITO, et al, ECS Trans., Vol. 80, 2017
[2]Linjun LI, Kohei ITO et al, Int. J. Hydrogen Energy, Vol. 49, 2024
[3] Linjun LI, Kohei ITO et al, Int. J. Hydrogen Energy, Vol. 47, 2022
[4] Linjun LI, Kohei ITO et al, J. Power Sources, Vol. 575, 2024