



Showcasing research from Doctor Chang's laboratory, Center for Energy Materials Research, Korea Institute of Science and Technology, Seoul, Republic of Korea.

Unveiling the high-temperature degradation mechanism of solid oxide electrolysis cells through direct imaging of nanoscale interfacial phenomena

Solid oxide electrolysis cell (SOEC) technology is the most efficient method for clean hydrogen production, but electrode delamination remains a critical issue. Our recent research, using advanced electron microscopy and density functional theory, has uncovered the nanometer-scale interfacial degradation that triggers delamination. Oxygen ions accumulate and alter the unit cell structure, causing strain and forming nanopores that lead to cracks and delamination. These findings challenge the old belief of gas pressure build-up and offer new directions for improving SOEC technology.

### As featured in:



See Kyung Joong Yoon,  
Hye Jung Chang *et al.*,  
*Energy Environ. Sci.*, 2024, 17, 5410.