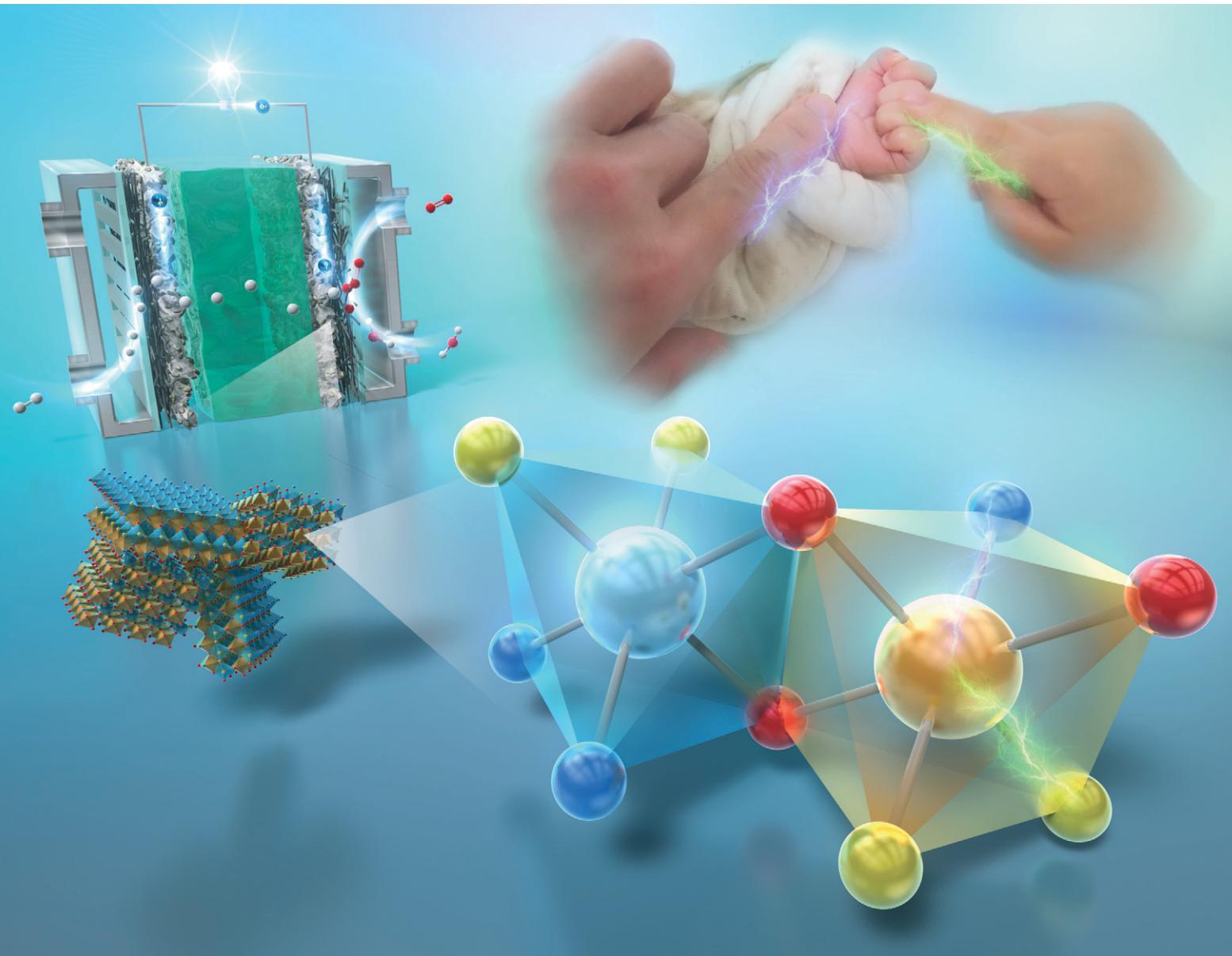


# Catalysis Science & Technology

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## PAPER

Mitsuharu Chisaka *et al.*  
Strengthening P-S bonding in  $\text{TiO}_2$  for enhanced fuel  
cell startup/shutdown durability with an N, P,  
S- $\text{TiO}_2$ /S-TiN catalyst