HydroGEN Dataset Metadata: 2019-12-18

author
maintainer_email
doi
institution (Arizona State University,Argonne National Laboratory,Boston University,Colorado School of Mines,Georgia Institute of Technology,GreenWay Energy LLC,Northeastern University,Proton Energy Systems Inc.,Proton Energy Systems Inc., United Technologies Research Center,University of Connecticut,Los Alamos National Laboratory,Nexceris,Rutgers State University of New Jersey New Brunswick Piscataway,Stanford University,University of Hawaii at Manoa,University of Michigan,Northwestern University,
University of Colorado Boulder,Sandia National Laboratory,National Renewable Energy Laboratory,Lawrence Berkeley National Laboratory,Idaho National Laboratory,Lawrence Livermore National Laboratory,Redox Power Systems,Savannah River National Laboratory,Saint-Gobain,The Chemours Company FC,University of California Irvine,University of California San Diego,University of Florida, University of Oregon,University of South Carolina,William Marsh Rice University)
technology_type (HTE,HTE-SOEC, LTE, LTE-AEME, LTE-PEME, PEC, STCH, STCH-Hybrid)
sample_barcode
sample_name
sample_description
collection_date
comments

data_type
Lab Experimental
Historical or Literature
Modeling and Simulation
External Data or Tools
Survey Data

capability_node (multi-choice)
INL Electrode and Electrolyte Elevated Temperature Water
INL Hydrided Material Performance
INL Catalysts for Harsh Environments
INL Evaluation of High Temperature Electrolysis Cells and Stacks
INL HTE Controlled Environment Stress and Corrosion
INL TAP Reactor System
LBNL DFT and Ab Initio Calculations
LBNL PEC In-Situ and Operando Nanoscale Characterization
LBNL Ionomer Characterization and Understanding
LBNL Metal Supported SOEC Cell
LBNL Multiscale Modeling of Water-Splitting Devices
LBNL Outdoor Testing for STCH
LBNL PEC Device Fabrication Facility
LBNL PEC Device In-Situ and Operando Testing
LBNL Photophysical Characterization of PEC Materials and Assemblies
LBNL Probing and Mitigating Corrosion
LBNL LCA Model for 1 GW PEC Plant
LBNL Modeling of PEC Devices
LBNL Scanning Droplet Cell for HTE Evaluation
LBNL Water Splitting Device Testing
LBNL Understanding Catalyst Inks and Ionomer Dispersions
LLNL Ab Initio Modeling of Electrochemical Interfaces
LLNL ALD Based Surface Functionalization and Porosity Control
LLNL Beyond DFT Simulation of Energetic Barriers
LLNL PEC Characterizing Degradation Processes
LLNL PEC Computational Materials Diagnostics and Optimization
LLNL Designer Catalytic Electrodes
LLNL In-Situ Operando X-Ray Characterization
LLNL Multiscale Modeling of Solid-State Interfaces and Microstructures
NREL CdTe PV Growth for Water Splitting
NREL Characterization of Semiconductor Properties
NREL Controlled Materials Synthesis and Defect Engineering
NREL Electrolysis Catalyst Synthesis and Ex Situ Electrochemical Performance
NREL Engineering of Plant for High-Temperature Systems
NREL Ex Situ Spatial Characterization Capabilities
NREL FPMT for Advanced Water Splitting Pathways
NREL High Flux Solar Furnace
NREL Multicomponent Ink Development High-throughput Fabrication and Scaling Studies
NREL Thin Film Combinatorial Capabilities for Advanced Water Splitting Technologies
NREL Systems Integration and Infrastructure
NREL I-III-VI Compound Semiconductors for Water Splitting
NREL III-V Semiconductor Epi-Structure
NREL In Situ Testing Capabilities for Hydrogen Generation
NREL Multi-Scale Thermochemical and Electrochemical Modeling
NREL PEC Nano-Scale Characterization Capabilities
NREL Novel Membrane Fabrication and Development for LTE and PEC
NREL PEC Solar-to-Hydrogen Benchmarking
NREL Secondary SIMS
NREL Surface Analysis Cluster Tool
NREL Surface Modifications for Catalysis and Corrosion Mitigation
NREL Techno-Economic Analysis of Hydrogen Production
NREL Hybrid Organic Inorganic Perovskites for Water Splitting
NREL Electronic Structure Modeling for Atomistic Understanding of Catalytic Materials
SNL Advanced Electron Microscopy
SNL Open-Source Multiphysics Research Platform
SNL Cascading Pressure Reactor
SNL Compound Semiconductor Science and Technology
SNL CSP Furnace
SNL Digital Printing and Coating
SNL Electron and In Situ Photon Beam Characterization
SNL HT-XRD and Complementary Thermal Analysis
SNL LAMMPS Code
SNL PEC Large Area Nanoimprinted Al Substrates
SNL Moab Code
SNL National Solar Thermal Test Facility
SNL Near Ambient Pressure E-XPS
SNL Novel Materials and Characterization for Electrocatalysis
SNL Optically Accessible Entrained Flow Reactor
SNL Peridigm Code
SNL Separators for Hydrogen Production
SNL SeqQuest Code
SNL Socorro Code
SNL SPPARKS
SNL STH Efficiency Prediction Platform
SNL Uncertainty Quantification in Computational Models
SNL Laser Heated Stagnation Flow Reactor for Characterizing Redox Chemistry
SRNL AWSM Requirements
SRNL Fabrication and Characterization of High Temperature Catalyst
SRNL High-Temperature Corrosion Mitigation and Materials Durability

measurement_types (multi-choice)
Dilatometry
Electrolysis
GC
IPCE
JV
LC
Optical Imaging
SEM
SFR
STH Efficiency
TEM
UVVis
XPS
XRD
Raman
Other

technology_type
HTE
HTE-oSOEC
HTE-pSOEC
LTE
LTE-AEME
LTE-PEME
PEC
STCH
STCH-Hybrid

HydroGEN Resource Metadata: 2019-11-04

data_source (NREL BB, NREL DS, LBL PEC Stand 1, LBL PEC Stand 2, Sandia SFR, LBL Electrolyzer Stand 1, LBL High-Temperature Corrosion Test Stand, LBL SOEC Test Station, SNL FEI Apero LoVac SEM, SNL FEI Helios 660 Nanolab SEM, SNL FEI Titan G2 TEM, SNL FEI Titan Themis Z TEM, SNL JEOL 1200 TEM, SNL JEOL 7600F SEM, Survey)
data_tool (Multi-spectra)
lab_environment (Indoor Lab, Outdoor Lab)
measurement (Biased, Non-biased)
literature_doi
literature_source
resource_comments

measurement_type
Dilatometry
Electrolysis
GC
IPCE
JV
LC
Optical Imaging
SEM
SFR
STH Efficiency
TEM
UVVis
XPS
XRD
Raman
Other

test_type
test_duration
temperature
pressure
break_in_procedure
mea_type
mea_area
inlet_h2_flow_rate
inlet_h20_flow_rate
inert_gas_flow_rate
sweep_gas (Air, N2, None)
sweep_gas_flow_rate
voltage
current_density

test_type
Polarization
Degradation
EIS

vir_method
step_method (Current, Voltage)
step_direction
step_holding_time
hfr_measured

xray_source_anode
xray_source_spectra
scattering_geometry_theta_min
scattering_geometry_theta_max
xrd_detector_type
detector_area

tem_operator
tem_acquisition_date
tem_acquisition_time
tem_specimen_name
tem_specimen_description
tem_model_name
tem_imaging_mode
tem_hv_setting
tem_magnification
tem_pixel_size
tem_pixel_array_size
tem_probe_current
tem_camera_length
tem_indicated_mag
tem_exposure
tem_collection_angle
tem_convergence_angle
tem_ccd_binning (Yes, No, Unknown)
tem_micron_bar

sem_detector_type
detector_sampling_time
detector_scanning_speed
magnification_max
magnification_pixel_size
magnification_working_distance
magnification_probe_voltage

mass

method
software
modelling_and_simulation_comments

operator
acquisition_timestamp
specimen_name
specimen_description