IX Acronyms and Abbreviations

°C	Degrees Celsius
°F	Degrees Fahrenheit
2-D	Two-dimensional
3-D	Three-dimensional
1Q	First quarter of the fiscal year
2Q	Second quarter of the fiscal year
3Q	Third quarter of the fiscal year
4Q	Fourth quarter of the fiscal year
6F	Hexafluorinated (biphenol A) sulfonated poly(arylene ether sulfone)
6F-CN-35	Hexafluorinated / nitrile-functional sulfonated poly(arylene ether sulfone) (35 is the degree of sulfonation, %)
Ω-cm^2	Ohm-square centimeter
A	Ampere, amp
Å	Angstrom
A/cm^2	Amps per square centimeter
A/D	Analog to digital
AC	Alternating current
ACR	Autothermal cyclic reforming
ACS	American Chemical Society
AEM	Analytical electron microscopy
AER	Absorption-enhanced reforming
AFCIA	Advanced Fuel Cells Implementing Agreement
AFM	Atomic force microscopy
Ag	Silver
AGB	Anode gas burner
AgCl	Silver chloride
AgS	Silver sulfide
AIChE	American Institute of Chemical Engineers
AIP	Analytical Interatomic Potential (computer model)
AirCred	Air Quality Credits tool
Al	Aluminum
Al_2O_3	Aluminum oxide
ANL	Argonne National Laboratory
ANSI	American National Standards Institute
Ap	Pool contact area
APU	Auxiliary power unit
Ar	Argon
As	Arsenic
ASF	Amps per square foot
a-Si	Amorphous silicon
ASIC	Application-specific integrated circuit
a-SiGe	Amorphous silicon germanium
ASME	American Society of Mechanical Engineers
ASR	Area-specific resistance
ASTM	American Society for Testing and Materials
atm	atmosphere
ATMI	Advanced Technical Materials Incorporated
ATP	Adenosine triphosphate
ATR	Autothermal reformer
Au	Gold
AuS	Gold sulfide
AXS	Advanced X-ray Solutions
B	Boron
Ba	Barium
barg	Bar gauge
BAT	Brown adipose tissue
BET	Bruner, Emmett and Teller surface area analysis method
BNL	Brookhaven National Laboratory
BOP	Balance of plant
BP	British Petroleum
BPSH	Biphenyl sulfone
BSE	Backscatter electron
BU	Boston University
C	Carbon
C&C	City and County of Honolulu
$CaCO_3$	Calcium carbonate
CAE	Computer-aided engineering
CaFCP	California Fuel Cell Partnership
CANMET	Canada Center for Mineral and Energy Technology
CaO	Calcium oxide
CAPEX	Capital expense
CATA	Centre Area Transit Authority
CAU	Clark Atlanta University
cc	Cubic centimeter
cc/g cat/hr	Cubic centimeters per gram catalyst per hour
CCD	Charge coupled device
CCH	Complex compound hydride
CCHSS	Complex compound hydrogen storage system

CCM	Catalyst-coated membrane
ccm	Cubic centimeters per minute
Ce	Cerium
CE	European Commonwealth certification mark
CEC	California Energy Commission
$CeCl_3$	Cerium trichloride
CEM	Compressor/Expander/Motor
CEM	Continuous emissions monitoring
CeO_2	Ceric oxide
Cermet	Combination of ceramic and metal
CESI	Catalytica Energy Systems, Inc.
CFD	Computational Fluid Dynamics
CGA	Compressed Gas Association
CGO	Cerium gadolinium oxide
CH_2	Compressed hydrogen gas
CH_3CHO	Acetaldehyde
CH_4	Methane
Chl	Chlorophyll
CHP	Combined heat and power
CIGS	Copper-indium-gallium-diselenide
CIS	CuInSe
CL	Catalytic layer
Cl	Chlorine
CLV	City of Las Vegas
cm	Centimeter
cm^2	Square centimeter
CME	Coefficient of Moisture Expansion (i.e. water swelling)
CMOS	Complementary metal oxide semiconductor
CMSA	Consolidated metropolitan statistical area
CNC	Computer numerical control
CNG	Compressed natural gas
CO	Carbon monoxide
Co	Cobalt
CO_2	Carbon dioxide
COS	Carbon oxysulfide
CO_x	Oxides of carbon
cpi	Cells per inch
CPOx	Catalytic partial oxidation
cpsi	Cells per square inch
CPSS	Combinatorial powder synthesis system
Cr	Chromium
CS	Constant stoichiometry
CS&D	Compression, storage and dispensing
CSA	Cell stack assembly
CSFTP	Cold-Start Federal Test Procedure
CSMP	Cabot Superior MicroPowders
CSTT	Codes and Standards Tech Team
CTO	Conductive transparent oxide
CTQ	Critical to quality
Cu	Copper
cu.yd.	Cubic yard
Cu_2O	Cuprous oxide
Cu_2S	Copper Sulfide
CUTE	Clean Urban Transport for Europe
CV	Cyclic voltammatry, cyclic voltammogram
CVD	Chemical vapor deposition
CWRU	Case Western Reserve University
DBEDT	Hawaii Department of Business, Economic Development and Tourism
DC	Direct current
DCEC	Delaware County Electric Cooperative, Inc.
DE	Distributed electrolysis
DFMA	Design for Manufacturing and Assembly
DFT	Density Functional Theory
DGE	Diesel gallon equivalent
DHW	Domestic hot water
DI	Deionized
dL/g	Deciliters per gram
DMA	Dynamic mechanical analysis
DMAc	Dimethyl acetamide
DMC	Dimethylcarbonate
DMFC	Direct methanol fuel cell
DMSO	Dimethyl sulfoxide
DNA	Deoxyribonucleic acid
DOE	U.S. Department of Energy
DOE EIA	Department of Energy, Energy Information Agency
DOS	Density of states
DP	Dew point
DRIFTs	Diffuse reflectance infrared Fourier transform spectroscopy
DSU	Delaware State University
e^-	Electron
E	Potential
$E_{1/2}$	Half-wave potential
Ea	Activation energy
EC	Electrochemical
EC	European Community
ECS	Electrochemical Society
ECSA	Electrochemical surface area

EDAX	Energy dispersive X-ray
EDC	Valence electron energy distribution curve
EDS	Energy dispersive x-ray spectroscopy
EERE	Office of Energy Efficiency and Renewable Energy
EESM	Electrical energy storage module
ELAT®	Registered Trademark of De Nora North America, Inc., covers GDLs and GDEs
Ep	Peak potential
EPA	U.S. Environmental Protection Agency
EPMA	Electron probe microanalyzer
EPR	Electron paramagnetic resonance
ESR	Electron spin resonance
ESS	Energy storage system
EtOH	Ethanol
ETS-10	Engelhard titanium silicate - 10
eV	Electron volt
ExCo	Executive Committee (of HIA)
F	Fluorine
F^-	Fluorine ion
FASTER	Feasibility of Acceptable Start Time Experimental Reactor
FC	Fuel cell
FCCP	Carbonyl cyanide m-chlorophenylhydrazone
FCPP	Fuel cell power plant
FCS	Fuel cell system
FCV	Fuel cell vehicle
Fe	Iron
Fe_2O_3	Ferric oxide
FEA	Finite element analysis
FER	Fluoride emission rate
fg-ELAT	Fine gradient ELAT
FHDS	Federal Highway Driving Schedule
FIRST	Fuel cell Innovative Remote Systems for Telecommunications (Spain)
FMEA	Failure modes and effects analysis
FP	Fuel processor
FPS	Fuel processing system
FRS	Functional requirement specifications
ft^2	Square feet
FTA	Federal Transit Administration
FUDS	Federal Urban Driving Schedule
fWGS	Forward water-gas shift
FY	Fiscal year
g	Gram
g/cc	Grams per cubic centimeter
g/min	Grams per minute
g/s	Grams per second
Ga	Gallium
GaAs	Gallium arsenic
GADDS	General area diffraction system
gal	Gallon
GC	Gas chromatograph
GC	GenCore
GC	Glassy, or vitreous carbon; a pure carbon that is amorphous (non-crystalline)
GC/MS	Gas chromatograph/Mass spectroscopy
GC5T	GenCore 5T platform prototype back-up fuel cell design for telecommunications
GCII	GenCore Gen II back-up fuel cell design
GCtool	Software package developed at ANL for analysis of fuel cells and other power systems
GDE	Gas diffusion electrode
GDL	Gas diffusion layer
GDS	Galvanodynamic scan
GE	General Electric
GEPC	Galactic Electric Power Cooperative, Inc.
GES	Giner Electrochemical Systems, LLC
GH_2	Gaseous hydrogen
GHG	Greenhouse gas
GHSV	Gas hourly space velocity
GIS	Geographic information system
GJ	Gigajoule
gm	Gram
gm/day	Grams per day
GPRE	Working Party on Pollution and Energy
GREET	Greenhouse Gas Energy and Emissions in Transportation model
GSS	Galvanostatic scan
GTI	Gas Technology Institute
GW	Gigawatt
GWe	Gigawatt electric
h	Hour

H	Hydrogen
H^-PO_4	Ortho-phosphoric acid
H+	Proton
H_2	Diatomic hydrogen
H_2 ICE	Hydrogen-fueled internal combustion engine
H_2A	Hydrogen Analysis
H_2O	Water
H_2O:C	Steam to carbon ratio
H_2O_2	Hydrogen peroxide
H_2PO_4	Dihydrogen phosphate anion
H_2S	Hydrogen sulfide
H_2SO_4	Sulfuric acid
H_3PO_4	Phosphoric acid
Hammer	Hazardous Materials Management and Emergency
HAZOP	Hazards and Operational Safety Analysis
HC	Hydrocarbon
HCl	Hydrochloric acid
$HClO_4$	Perchloric acid
HCNG	Hydrogen-compressed natural gas
HDMR	Hydrogen-driven metallurgical reactions
HE	Heat exchanger
He	Helium
HEM	Hydroxyl ion exchange membrane
HER	Hydrogen evolution reaction
HEV	Hybrid electric vehicle
Hf	Hafnium
HF	Hydrofluorhydric acid
HFCIT	Hydrogen, Fuel Cells and Infrastructure Technologies Program
HFCTF	Hawaii Fuel Cell Test Facility
HFI	Hydrogen Fuel Initiative
HFR	High-frequency impedance
Hg	Mercury
Hg_2SO_4	Mercurous sulfate
HHV	Higher heating value
HIA	Hydrogen Implementing Agreement
HNEI	Hawaii Natural Energy Institute
Hp	Average pool height
hp	Horsepower
HPE	Hybrid photoelectrode
hr	Hour
HRTEM	High-resolution transmission electron microscope
HSAC	High surface area carbon
HSO_4	Bisulfate anion
HT	High-temperature
HT	High-throughput
HTFC	High-temperature fuel cell
HTM	High-temperature membrane
HTS	High-temperature shift
HTSC	High-temperature shift converter
HTXRD	High-temperature X-Ray diffraction
Hythane	Compressed hydrogen natural gas blend
Hz	Hertz
I	Current
IBAD	Ion beam assisted deposition
ICC	International Code Council
ICE	Internal combustion engine
ICEV	Internal combustion engine vehicle
ICP	Inductively coupled plasma
ICP-MS	Inductively coupled plasma mass spectrometry
ICR	Interfacial contact resistance
IEA	International Energy Agency
IEC	International Electrotechnical Commission
IEC	Ion exchange capacity
IEEE	Institute of Electrical and Electronics Engineers, Inc.
IIT	Illinois Institute of Technology
In	Indium
INEEL	Idaho National Engineering and Environmental Laboratory
InP	Indium phosphorus
IPCE	Incident photon conversion to electrons
IPHE	International Partnership for Hydrogen Energy
IR	Infrared
Ir	Iridium
IR	Voltage loss due to resistance
ISE	International Society of Electrochemistry
ISO	International Organization for Standardization
ITM	Ion transport membrane
ITO	Indium tin oxide
ITR	Integrated test rig
I-V	Current-voltage
IV	Inherent viscosity
J	Joule
K	Kelvin
K	Potassium
kÅ	1000 angstroms
kbar	1000 bar

KBr	Potassium bromide
kBTU	1000 British thermal units
kcal	Kilocalorie
kcal/mol	Kilocalories per mole
kDa	Kilo-Daltons
KeV	Kilo electron volts
kg	Kilogram
kg/day	Kilograms per day
kg/hr	Kilograms per hour
khr	1000 hours
KIC	Key industrial collaborators
kJ	Kilojoule
kJ/mol	Kilojoules per mole
KOH	Potassium hydroxide
kPa	Kilopascal
kW	Kilowatt
kWe	Kilowatt electric
kWh	Kilowatt-hour
kWh/kg	Kilowatt-hours per kilogram
kWh/L	Kilowatt-hours per liter
kWt	Kilowatt thermal
L	Liter
L/h	Liters per hour
L/min	Liters per minute
La	Lanthanum
LANL	Los Alamos National Laboratory
LAX	Los Angeles International Airport
lb	Pound
LBNL	Lawrence Berkeley National Laboratory
LCC	Lansing Community College
LCHPP	Low Cost Hydrogen Production Platform (DOE Program Title)
LDV	Light-duty vehicle
LED	Light-emitting diode
LEEM	Low-energy electron microscopy
LEIS	Low-energy ion scattering
LEMSYS	Local energy management system
LH_2	Cryogenic liquid hydrogen
LHV	Lower heating value
Li	Lithium
LiH	Lithium hydride
LLC	Limited Liability Company
LLNL	Lawrence Livermore National Laboratory
low-dP	Low pressure drop
Lpm	Liters per minute
LSGM	Lanthanum strontium gallium magnesium oxide
LT	Low-temperature
LTS	Low-temperature shift
m	Meter
M	Molar
m/s	Meters per second
m^2/g	Square meters per gram
m^2/s	Square meters per second
M31	Atofina membrane candidate
mA	MilliAmps
mA/cm^2	Milliamps per square centimeter
MBL	Modified boundary layer
MCFC	Molten carbonate fuel cell
mCoul	Millicoulomb
MEA	Membrane electrode assemble
MEEEEC	Mohegan Energy, Environmental, Economics Education Center
MEMS	Micro Electromechanical System
MEMSYS	Micro-grid Energy Management System
MeOH	Methanol
MEOP	Maximum Expected Operat¬ing Pressure
meq	Milliequivalents
meq/gram	Milliequivalents/gram
Mg	Magnesium
mg	Microgram
mg	Milligram
$Mg(OH)_2$	Magnesium hydroxide
mg/cm^2	Milligrams per square centimeter
$MgCl_2$	Magnesium chloride
MgH_2	Magnesium hydride
MgO	Magnesium oxide
MHCoE	Metal Hydride Center of Excellence
min	Minute
MJ	Megajoules
mL	Milliliter
ml/h	Milliliters per hour
µm	Micrometer, micron
µM	Micromolar
mm	Millimeter
MM	Molecular modeling
MMBtu	Millions of British thermal units
µmol	Micromole
MMOM	Microporous metal oxide matrix
Mn	Manganese
MO	Fetal Organic Framework
Mo	Molybdenum
mol	Mole
mol%	Mole percent
mol/min	Moles per minute

mole/(m^2Pa•s)	Mole per meter squared Pascal second (flux unit)
MoO_3	Molybdenum trioxide (molydite)
MoPc	Molybdenum phthalocyanine
MPa	Megapascal
mpgge	Miles per gallon gasoline equivalent
mph	Miles per hour
MRI	Magnetic resonance imaging
MRS	Materials Research Society
ms	Milliseconds
mS/cm	Milli-Siemens per centimeter
MSCFD	Thousand standard cubic feet per day gas flowrate
MSHA	Mine Safety and Health Administration
MSU	Montana State University
MT	Medium-throughput
MTI	McDermott Technology, Inc.
mV	Micro volt
mV	Millivolt
MW	Megawatt
MW	Molecular weight
mΩ	Milli-ohms
MWe	Megawatts electric
MWh	Megawatt-hour
MWNT	Multi-wall nanotube
MWth	Megawatts thermal
MYPP	Multi-Year Program Plan (the HFCIT Program's Multi-Year Research, Development and Demonstration Plan)
MYRDDP	Multi-Year Research, Development and Demonstration Plan
N	Nitrogen
N/cm^2	Newtons per square centimeter
N112	Nafion 1100 equivalent weight, 2 millimeter thick membrane
N_2	Diatomic nitrogen
Na	Sodium
Na_3AlH_6	Trisodium hexahydroaluminate
$NaAlH_4$	Sodium aluminum hydride (sodium tetrahydroaluminate)
$NaBH_4$	Sodium borohydride
NaCl	Sodium chloride
NAFION®	Registered Trademark of E.I. DuPont de Nemours
NaH	Sodium hydride
NaOH	Sodium hydroxide
NASA	National Aeronautics and Space Administration
NASA PERS	National Aeronautics and Space Agency Polymer Energy Rechargeable System
NAVSEA	Carderock Naval Sea Systems Command Carderock Division
Nb	Niobium
NCMS	National Center for Manufacturing Sciences
NCNR	NIST Center for Neutron Research
ND	Not determined at this time
Nd:YAG	Neodymium-doped yttrium aluminum garnet
NDIR	Non-dispersive infrared
NEBS	Network Equipment-Building System
NEDC	New European Driving Cycle
NEMS	National Energy Modeling System
NEPA	National Environmental Policy Act
NETL	National Energy Technology Laboratory
NEU	Northeastern University
NFC	Near frictionless carbon
NFPA	National Fire Protection Association
NG	Natural gas
NH_3	Ammonia
NHA	National Hydrogen Association
NHE	Normal hydrogen electrode
Ni	Nickel
NICC	Natural gas Infrastructure Component Cost model
NiMH	Nickel metal hydride
NIST	National Institute of Standards and Technology
nm	Nanometer
NMHC	Non-methane hydrocarbons
NMOG	Non-methane organic gases
nmol	Nanomole
NMP	N-methyl pyrollidone
NMR	Nuclear magnetic resonance
NO_2	Nitric oxide
NO_x	Oxides of nitrogen
NPM	Non-precious metal
NPV	Net present value
NRECA	National Rural Electric Cooperative Association
NREL	National Renewable Energy Laboratory
NSSN	National Resource for Global Standards
NSTF	Nanostructured thin film

O	Oxygen
O&M	Operation and maintenance
O_2	Diatomic oxygen
O_2:C	Oxygen to carbon ratio
OCV	Open circuit voltage
OEM	Original equipment manufacturer
OG	Off-gas
OH^-	Hydroxyl radical
OMB	Office of Management and Budget
OPEX	Operating expense
OPM	Oxford Performance Materials, Inc.
ORNL	Oak Ridge National Laboratory
ORR	Oxygen reduction reaction
OTM	Oxygen transport membrane
OTT	Office of Transportation Technologies
OU	Ohio University
P	Phosphorus
P	Pressure
P&ID	Process and Instrumentation Diagram
Pa	Pascal
PADD	Petroleum Administration for Defense Districts
PAFC	Phosphoric acid fuel cell
PBI	Polybenzimidazole
PCS	Power conditioning system
PCT	Pressure concentration temperature
Pd	Palladium
PDC	Polymer-derived ceramic
Pd-MIS	Palladium-based metal-insulator-semiconductor
PDU	Process development unit
PEC	Photoelectrochemical
PECH	Polyepichlorohydrin
PEEK	Polyetherketones
PEFC	Polymer electrolyte fuel cell
PEFC	Proton exchange fuel cell
PEI	Polyether imide
PEKK	Poly (ether ketone ketone)
PEM	Polymer electrolyte membrane, proton exchange membrane
PEMFC	Polymer electrolyte membrane fuel cell
PEN	Positive-Electrolyte-Negative
PES	Polyethersulfone
PES	Power Engineering Society
PFD	Process flow diagram
PFSA	Perfluorinated sulfonic acid
PGM	Platinum group metal
Pl	Platinum
PM	Particulate matter
PM	Particulate membrane
PM	Precious metal, such as platinum
PNNL	Pacific Northwest National Laboratory
POC	Proof of concept
POX	Partial oxidation
PP1R	Power Plant One Reformate
ppb	Parts per billion
ppbv	Parts per billion by volume
ppm	Parts per million
ppmv	Parts per million by volume
ppmw	Parts per million by weight
ppt	Parts per trillion
Pr	Praseodymium
PrOx	Preferential oxidation
PS	Photosystem
PS	Potentiostatic
PSA	Pressure swing adsorption
PSAT	Puget Sound Action Team
PSAT	Vehicle simulation software package developed at Argonne National Laboratory
psi	Pounds per square inch
psia	Pounds per square inch absolute
psid	Pounds per square inch differential
psig	Pounds per square inch gauge
PSII	Photosystem II
PSU	Pennsylvania State University
PSU OPP	Penn State University, Office of Physical Plant
PSU PTI	Penn State University, Pennsylvania Transportation Institute
Pt	Platinum
P-T	Pressure-temperature
Pt_3Co	Platinum-cobalt alloy
Pt_3Ni	Platinum-nickel alloy
PTFE	Teflon – poly-tetrafluoroethylene
Pt-FePO	Platinum iron phosphate
PTM	Proton transport membrane
PtML	Platinum monolayer
Pt-SnO	
Pt-TaPO	Platinum tantalum phosphate
PURE	Promoting Unst Renewable Energy (UK)
PV	Photovoltaic
PVDF	Polyvinylidenefluoride
P-V-T	Pressure-Volume-Temperature
Q1, Q2, Q3, Q4	Quarters of the fiscal year

QFD	Quality Function Deployment
R&D	Research and development
RBS	Rutherford backscattering
RD&D	Research, development & demonstration
RDE	Rotating disk electrode
Re	Rhenium
RFC	Regenerative fuel cell
RFP	Request for proposals
RH	Relative humidity
Rh	Rhodium
RHE	Reference hydrogen electrode
rpm	Revolutions per minute
RRDE	Rotating ring disc electrode
RTD	Resistance thermal device
RTI	Research Triangle Institute
Ru	Ruthenium
s	Second
S	Siemens
S	Sulfur
S/C	Steam-to-carbon ratio
S/cm	Siemens per centimeter
S300	Series 300 fuel processing and PEM cell system
SA	Specific activity
SAD	Surface-averaged distribution
SAE	Society of Automotive Engineers
Sc	Scandium
sccm	Standard cubic centimeters per minute
SCE	Saturated calomel electrode
SCF, scf	Standard cubic feet
scfd	Standard cubic feet per day
SCFH, scfh	Standard cubic feet per hour
ScSZ	Scadia stabilized zirconia
SD	Standard deviation
SDA	Structure directing agent
SDO	Standards Development Organization
Se	Selenium
sec	Second
SEM	Scanning electron microscope
SEMaC	Smart Energy Management Controller
SEP	Subscale engineering prototype
SF_6	Sulfur hexafluoride
SHE	Standard hydrogen electrode
Si	Silicon
SiO_2	Silicon dioxide
SLPM	Standard liters per minute
Sm	Samarium
SMR	Steam methane reformer
Sn	Tin
$SnCl_2$	Stannous chloride
SNG	Synthetic natural gas
SNL	Sandia National Laboratory
SO_2	Sulfur dioxide
SOFC	Solid oxide fuel cell
SOM	Solid-oxide oxygen-ion-conducting membrane
SO_x	Oxides of sulfur
SPC	Statistical process control
SPEKK	Sulfonated polyether ether ketone
sq.ft.	Square foot
SR	Steam reformer
Sr	Strontium
SRI	Stanford Research Institute International
SS	Stainless steel
STAR	Substrate-based Transportation Autothermal Reformer
STCH	Solar thermochemical hydrogen
STEM	Scanning transmission electron microscope
STH	Solar-to-hydrogen
STM	Scanning tunneling microscope
STTP	Shared Technology Transfer Project
SUNY	State University of New York
SWNT	Single-walled nanotube
SwRI	Southwest Research Institute
T	Temperature
t	Time
t/d	tonnes per day
Ta	Tantalum
TAFV	Transition Alternative Fuels and Vehicles
TAG	Technical Advisory Group
TC	Thermocouple
TCGC	Thermal conductivity gas chromatograph
TDARMS	Thermal desorption and recoiling mass spectrometry
TEM	Transmission electron microscopy
TESI	Teledyne Energy System Inc.
Tg	Glass transition temperature
TGA	Thermal gravimetric analysis
THC	Total hydrocarbons
Ti	Titanium
$TiCl_3$	Titanium trichloride
TiH_2	Titanium hydride

TIM	Traction inverter motor
TiO_2	Titanium dioxide
TIVM	Toroidal intersecting vane machine
Tla	Truncated light-harvesting chlorophyll antenna
tla1	Mutant of the Tla1 gene
tlaX	Mutant of unknown gene with a truncated light-harvesting chlorophyll antenna
TM	Transition metal
TMS	Thermal management system
TPD	Temperature-programmed desorption
TPR	Temperature-programmed reduction
TTW	Through the wafer
TWh	TeraWatt-hour
TWM	Thermal and water management
Type IV	Plastic lined tanks completely overwrapped with composite
UC	University of California
UCP	Uncoupling protein
UGA	University of Georgia, Athens
UH	University of Hawaii
UHV	Ultra-high vacuum
UL	Underwriters Laboratory
UNIGEN®	A registered trademark of Proton Energy Systems, Inc.
UPD	Underpotential deposition
UPS	Uninterruptible power supply
US06	Driving cycle to simulate high-speed vehicle operation
USC	University of South Carolina
USDA	U.S. Department of Agriculture
USFCC	United States Fuel Cell Council
UTC FC	United Technologies Corporation Fuel Cells
UTRC	United Technologies Research Center
UV	Ultraviolet
UV-Vis	Ultraviolet-Visual
V	Vanadium
V	Volt
VASP	Vienna Ab-initio Simulation Package
VC	Vulcan carbon
VHTS	Virtual high-throughput screening
VNT	Variable nozzle turbine
VOC	Volatile organic compound
vol	Volume
vol%	Volume percent
VR	Voltage – current – resistance curve
W	Tungsten
W	Watt
W/L	Watts per liter
W/m-K	Watts per meter-Kelvin
WDS	Wavelength dispersive spectroscopy
We	Watt electric
WGS	Water gas shift
W-h/kg	Watt-hours per kilogram
W-h/L	Watt-hours per liter
WHSV	Weight hourly space velocity
WO_3	Tungsten trioxide
Wt	Watts thermal
WT	Wild-type (unmutated)
wt%	Weight percent (percent by weight)
XANES	X-ray absorption near-edge spectroscopy
XAS	X-ray absorption spectroscopy
Xe	Xenon
XEDS	Energy dispersive analysis of X-rays
XPS	X-ray photoelectron spectroscopy
XRD	X-ray diffraction
XRF	X-ray fluorescence
Y	Yttrium
Yb	Ytterbium
YSZ	Yttria-stablized zirconia
ZnO	Zinc oxide
Zr	Zirconium
ZrO_2	Zirconium dioxide