

Prof. DEREK KEITH BAKER

Personal Information

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Education Information

Doctorate, The University Of Texas At Austin, Mechanical Engineering, United States Of America 1996 - 2000

Post Graduate, The University Of Texas At Austin, Mechanical Engineering, United States Of America 1994 - 1996

Under Graduate, Virginia Polytechnic Institute And State University, Mechanical Engineering, United States Of America 1987 - 1992

Dissertations

Doctorate, An investigation of calcium carbonate scaling rates based on experiments and modeling, The University Of Texas At Austin, Mechanical Engineering, 2000

Post Graduate, Software to predict scaling problems in solar hot water systems, The University Of Texas At Austin, Mechanical Engineering, 1996

Research Areas

Mechanical Engineering, Energy, Solar energy, Engineering and Technology

Academic Titles / Tasks

Professor, Middle East Technical University, Faculty of Engineering, Makine Mühendisliği Bölümü, 2015 - Continues

Associate Professor, Middle East Technical University, Faculty of Engineering, Makine Mühendisliği Bölümü, 2014 - 2015

Associate Professor, Middle East Technical University, Faculty of Engineering, Makine Mühendisliği Bölümü, 2011 - 2012

Assistant Professor, Middle East Technical University, Faculty of Engineering, Makine Mühendisliği Bölümü, 2003 - 2010

Assistant Professor, Humboldt State University, Natural Sciences, Environmental Systems Engineering, 2000 - 2003

Advising Theses

BAKER D. K. , Modelling and performance analysis of linear fresnel collector for process heat generation for Ice Cream Factory in Konya, Post Graduate, R.SINGH(Student), 2017

TARI İ., BAKER D. K. , Conceptual design and heat transfer investigation of a dense granular flow solar receiver, Post Graduate, E.FAİR(Student), 2017

TARI İ., BAKER D. K. , Numerical comparison and sizing of sensible and latent thermal energy storage for compressed air energy storage, Post Graduate, M.KAYA(Student), 2015

GÜVENÇ YAZICIOĞLU A., BAKER D. K. , Design and modeling of a novel rectifier with ceramic hollow fiber membrane contactor for miniaturized absorption cooling devices, Post Graduate, O.ÖZKAN(Student), 2015

GÜVENÇ YAZICIOĞLU A., BAKER D. K. , Modelling, transient simulations and parametric studies of parabolic trough collectors with thermal energy storage, Post Graduate, T.AKBA(Student), 2014

BAKER D. K. , Modelling and transient analysis of a hybrid liquid Desiccant cooling system, Post Graduate,

A.KARSHENASS(Student), 2014

BAKER D. K. , Methodology to size large scale solar PV installations for institutions with unidirectional metering, Post Graduate, M.ARSALAN(Student), 2014

BAKER D. K. , Theoretical and experimental investigation on characteristics of adsorption cooling systems using advanced porous materials, Post Graduate, N.BONYADI(Student), 2014

Articles Published in Journals That Entered SCI, SSCI and AHCI Indexes

- **A Monte Carlo method to solve for radiative effective thermal conductivity for particle beds of various solid fractions and emissivities**
Johnson E., TARI İ., Baker D.
JOURNAL OF QUANTITATIVE SPECTROSCOPY & RADIATIVE TRANSFER, vol.250, 2020 (Journal Indexed in SCI)
- **Solar-thermal driven drying technologies for large-scale industrial applications: State of the art, gaps, and opportunities**
Kamfa I., Fluch J., Bartali R., Baker D.
INTERNATIONAL JOURNAL OF ENERGY RESEARCH, 2020 (Journal Indexed in SCI)
- **Modeling, transient simulations and parametric studies of parabolic trough collectors with thermal energy storage**
Akba T., Baker D., GÜVENÇ YAZICIOĞLU A.
SOLAR ENERGY, vol.199, pp.497-509, 2020 (Journal Indexed in SCI)
- **An investigation of optimum PV and wind energy system capacities for alternate short and long-term energy storage sizing methodologies**
Al-Ghussain L., Taylan O., BAKER D. K.
INTERNATIONAL JOURNAL OF ENERGY RESEARCH, vol.43, pp.204-218, 2019 (Journal Indexed in SCI)
- **Sizing of Photovoltaic-Wind-Battery Hybrid System for a Mediterranean Island Community Based on Estimated and Measured Meteorological Data**
Sadati S. M. S. , Jahani E., Taylan O., BAKER D. K.
JOURNAL OF SOLAR ENERGY ENGINEERING-TRANSACTIONS OF THE ASME, vol.140, 2018 (Journal Indexed in SCI)
- **Technoeconomic and exergy analysis of a solar geothermal hybrid electric power plant using a novel combined cycle**
Bonyadi N., Johnson E., BAKER D. K.
ENERGY CONVERSION AND MANAGEMENT, vol.156, pp.542-554, 2018 (Journal Indexed in SCI)
- **Numerical Analysis of Phase Change Material Characteristics Used in a Thermal Energy Storage Device**
Bonyadi N., Somek S. K. , Ozalevli C. C. , Baker D., TARI İ.
HEAT TRANSFER ENGINEERING, vol.39, pp.268-276, 2018 (Journal Indexed in SCI)
- **Solar energy potentials in strategically located cities in Nigeria: Review, resource assessment and PV system design**
Okoye C. O. , Taylan O., BAKER D. K.
RENEWABLE & SUSTAINABLE ENERGY REVIEWS, vol.55, pp.550-566, 2016 (Journal Indexed in SCI)
- **Energetic and economic performance analyses of photovoltaic, parabolic trough collector and wind energy systems for Multan, Pakistan**
Sadati S. M. S. , Qureshi F. U. , BAKER D. K.
RENEWABLE & SUSTAINABLE ENERGY REVIEWS, vol.47, pp.844-855, 2015 (Journal Indexed in SCI)
- **A study to incorporate renewable energy technologies into the power portfolio of Karachi, Pakistan**
Ali S. M. H. , Zuberi M. J. S. , Tariq M. A. , BAKER D. K. , Mohiuddin A.
RENEWABLE & SUSTAINABLE ENERGY REVIEWS, vol.47, pp.14-22, 2015 (Journal Indexed in SCI)
- **Modeling and simulations of a micro solar power system**
Pehlivanurk C., Ozkan O., BAKER D. K.
INTERNATIONAL JOURNAL OF ENERGY RESEARCH, vol.38, pp.1129-1144, 2014 (Journal Indexed in SCI)

- **Two dimensional transient coupled analysis of a finned tube adsorbent bed for a thermal wave cycle**
ÇAĞLAR A., Yamali C., BAKER D. K.
INTERNATIONAL JOURNAL OF THERMAL SCIENCES, vol.73, pp.58-68, 2013 (Journal Indexed in SCI)
- **MEASUREMENT OF SOLAR RADIATION IN ANKARA, TURKEY**
Caglar A., Yamali C., BAKER D. K. , KAFTANOĞLU B.
ISI BILIMI VE TEKNIGI DERGISI-JOURNAL OF THERMAL SCIENCE AND TECHNOLOGY, vol.33, pp.135-142, 2013
(Journal Indexed in SCI)
- **Solar repowering of Soma-A thermal power plant**
YILMAZOĞLU M. Z. , DURMAZ A., BAKER D. K.
ENERGY CONVERSION AND MANAGEMENT, vol.64, pp.232-237, 2012 (Journal Indexed in SCI)
- **A two-energy equation model for dynamic heat and mass transfer in an adsorbent bed using silica gel/water pair**
Solmus I., Rees D. A. S. , Yamali C., Baker D.
INTERNATIONAL JOURNAL OF HEAT AND MASS TRANSFER, vol.55, pp.5275-5288, 2012 (Journal Indexed in SCI)
- **COP trends for ideal thermal wave adsorption cooling cycles with enhancements**
Taylan O., BAKER D. K. , KAFTANOĞLU B.
INTERNATIONAL JOURNAL OF REFRIGERATION-REVUE INTERNATIONALE DU FROID, vol.35, pp.562-570, 2012
(Journal Indexed in SCI)
- **Numerical investigation of coupled heat and mass transfer inside the adsorbent bed of an adsorption cooling unit**
Solmus I., Rees D. A. S. , Yamali C., Baker D., KAFTANOĞLU B.
INTERNATIONAL JOURNAL OF REFRIGERATION-REVUE INTERNATIONALE DU FROID, vol.35, pp.652-662, 2012
(Journal Indexed in SCI)
- **Experimental investigation of a natural zeolite-water adsorption cooling unit**
Solmus I., KAFTANOĞLU B., Yamali C., Baker D.
APPLIED ENERGY, vol.88, pp.4206-4213, 2011 (Journal Indexed in SCI)
- **MODELING OF BIPOLAR PLATES FOR PROTON EXCHANGE MEMBRANE FUEL CELLS**
Ekiz A., Camci T., Turkmen I., SANKIR M., USLU S., BAKER D. K. , Agar E.
JOURNAL OF THE FACULTY OF ENGINEERING AND ARCHITECTURE OF GAZI UNIVERSITY, vol.26, pp.591-605, 2011 (Journal Indexed in SCI)
- **International Summer Engineering Program on fuel cells for undergraduate engineering students**
BAKER D. K. , Agar E.
INTERNATIONAL JOURNAL OF HYDROGEN ENERGY, vol.36, pp.3712-3725, 2011 (Journal Indexed in SCI)
- **Adsorption properties of a natural zeolite-water pair for use in adsorption cooling cycles**
Solmus I., Yamali C., KAFTANOĞLU B., Baker D., Caglar A.
APPLIED ENERGY, vol.87, pp.2062-2067, 2010 (Journal Indexed in SCI)
- **Thermodynamic limits to thermal regeneration in adsorption cooling cycles**
BAKER D. K.
INTERNATIONAL JOURNAL OF REFRIGERATION-REVUE INTERNATIONALE DU FROID, vol.31, pp.55-64, 2008
(Journal Indexed in SCI)
- **Predicted impact of collector and zeolite choice on the thermodynamic and economic performance of a solar-powered adsorption cooling system**
Baker D. K. , Kaftanoglu B.
EXPERIMENTAL HEAT TRANSFER, vol.20, pp.103-122, 2007 (Journal Indexed in SCI)
- **Identifying and reducing scaling problems in solar hot water systems**
Baker D. K. , Vliet G.
JOURNAL OF SOLAR ENERGY ENGINEERING-TRANSACTIONS OF THE ASME, vol.125, pp.61-66, 2003 (Journal Indexed in SCI)
- **Designing solar hot water systems for scaling environments**
Baker D. K. , Vliet G.
JOURNAL OF SOLAR ENERGY ENGINEERING-TRANSACTIONS OF THE ASME, vol.123, pp.43-47, 2001 (Journal

Articles Published in Other Journals

- **Normalized Thermodynamic Model for Intermittent Energy Systems and Application to Solar-Powered Adsorption Cooling Systems**
Taylan O., BAKER D. K. , Kaftanoglu B.
INTERNATIONAL JOURNAL OF THERMODYNAMICS, vol.14, pp.107-115, 2011 (Journal Indexed in ESCI)

Books & Book Chapters

- **Technical Study of a Hybrid Solar-Geothermal Power Plant and its Application to a Thermal Design Course**
BAKER D. K. , Özalevli C., Sömek K.
in: Progress in Clean Energy Volume 2 Novel Systems and Applications, Dincer, I., Colpan, C.O., Kizilkan, O., Ezan, M.A., Editor, Springer, Cham, pp.887-910, 2015
- **Modeling and Transient Simulations of 30 MW Solar Thermal Electric Power Plants in the Northeast Mediterranean Region**
BİLYAZ S., Singh R., KARSHENASS A., BAKER D. K.
in: Progress in Clean Energy Volume 2 Novel Systems and Applications, Dincer, I., Colpan, C.O., Kizilkan, O., Ezan, M.A. , Editor, Springer, Cham, pp.1099-1114, 2015
- **Technical Analysis of Hybrid Desiccant Cooling in a Mediterranean Climate**
KARSHENASS A., BAKER D. K. , YAMALI C., Singh R.
in: Progress in Clean Energy Volume 2 Novel Systems and Applications, Dincer, I., Colpan, C.O., Kizilkan, O., Ezan, M.A. , Editor, Springer, Cham, pp.911-928, 2015
- **Thermodynamics An Integrated Learning System**
schmidt P., Ezekoye O., Howell J., BAKER D. K.
John Wiley & Sons, 2006

Refereed Congress / Symposium Publications in Proceedings

- **Development of View Factor Correlations for Modeling Thermal Radiation in Solid Particle Solar Receivers Using CFD-DEM**
johnson e., BAKER D. K. , TARI İ.
SolarPACES2018: Solar Power and Chemical Energy Systems, Morocco, Morocco, 2 - 05 October 2018
- **NUMERICAL COMPARISON AND SIZING OF SENSIBLE AND LATENT THERMAL ENERGY STORAGE FOR COMPRESSED AIR ENERGY STORAGE SYSTEMS**
Kaya M., TARI İ., BAKER D. K.
ASME International Mechanical Engineering Congress and Exposition (IMECE2016), Arizona, United States Of America, 11 - 17 November 2016
- **Proposal of a Novel Gravity-Fed, Particle-Filled Solar Receiver**
JOHNSON E., Baker D., TARI İ.
22nd International Conference on Concentrating Solar Power and Chemical Energy Systems (SOLARPACES), Abu Dhabi, United Arab Emirates, 11 - 14 October 2016, vol.1850
- **TECHNICAL FEASIBILITY STUDY OF A SOLAR GEOTHERMAL HYBRID ELECTRIC POWER PLANT USING A COMBINED CYCLE**
bonyadi n., johnson e., BAKER D. K.
SolarPaces 2016 Conference, Abu Dhabi, United Arab Emirates, 11 - 14 October 2016

- **Study Case of Solar Thermal and Photovoltaic Heat Pump System for Different Cities in Turkey**
Moia-Pol A., Pujol-Nadal R., Martinez-Moll V., Bonyadi N., Baker D.
11th ISES EuroSun Conference, Palma, Spain, 11 - 14 October 2016, pp.762-766
- **Experimental analysis of energy storage device using phase change material integrated with a milk storage system**
NIMA B., SOMEK S. K. , C CIHAN O., BAKER D. K. , TARI İ.
1st Thermal and Fluid Engineering Summer Conference, TFESC, New-York, United States Of America, 9 - 12 August 2015
- **Numerical Analysis of Phase Change Material Characteristics in a Thermal Energy Storage Heat Exchanger**
NIMA B., SOMEK S. K. , OZALEVLI C. C. , BAKER D. K. , TARI İ.
ASME-ATI-UIT 2015 Conference on Thermal Energy Systems: Production, Storage, Utilization and the Environment, Napoli, Italy, 17 - 20 May 2015
- **EXPERIMENTAL INVESTIGATION OF SINGLE-PHASE LIQUID FLOW AND HEAT TRANSFER IN MULTIPORT MINICHANNELS**
Altinoz M., GÜVENÇ YAZICIOĞLU A., Baker D.
12th International Conference on Nanochannels, Microchannels and Minichannels (ICNMM), Illinois, United States Of America, 3 - 07 August 2014
- **TRENDS IN COP FOR ADSORPTION COOLING CYCLES WITH THERMAL REGENERATION AND FINITE NUMBER OF BEDS**
BAKER D. K. , Kaftanoglu B.
2nd International Conference on Energy Sustainability, Florida, United States Of America, 10 - 14 August 2008, pp.601-608
- **ThermoNet: Part of an integrated website-textbook system**
Baker D., Canlidinc A.
International Conference on Education and Information Systems - Technologies and Application, Florida, United States Of America, 21 - 25 July 2004, pp.199-204

Supported Projects

- BAKER D. K. , CB Strateji ve Bütçe Başkanlığı (Kalkınma Bakanlığı) Projesi, GÜNAM Expansion project, 2014 - Continues
- Baker D. K. , Kale N., Kazanç Özerinç F., H2020 Project, GEOSMART, 2019 - 2023
- Baker D. K. , Tari I., Okutucu Özyurt H. T. , Akata Kurç B. , Çulfaz Emecen P. Z. , Kurt Z., Erden Topal Y., H2020 Project, SolarTwins: Solar Twinning to Create Solar Research Twins, 2020 - 2022
- Baker D. K. , Bial M., Erden Topal Y., Erdil E., Pamukcu M. T. , Akçomak I. S. , Aydinoğlu A. U. , H2020 Project, HORIZON-STE: Implementation of the Initiative for Global Leadership in Solar Thermal Electricity, 2019 - 2022
- Baker D. K. , Sanchez R., Tari I., H2020 Project, Solar Facilities for the European Research Area - Third Phase, 2019 - 2022
- Tarı İ., Bayer Ö., Baker D. K. , Kazanç Özerinç F., TÜBİTAK International Bilateral Joint Cooperation Program Project, Atık Çamurların Değerlendirilmesi İçin Güneş Enerjili Kurutma Teknolojileri Geliştirilmesi, 2018 - 2020
- Bayer Ö., Tari I., Baker D. K. , Nitz P., H2020 Project, INSHIP: Integrating National Research Agendas on Solar Heat for Industrial Processes, 2017 - 2020
- Turan R., Baker D. K. , Okutucu Özyurt H. T. , Tari İ., Güvenç Yazıcıoğlu A., CB Strateji ve Bütçe Başkanlığı (Kalkınma Bakanlığı) Projesi, 2015K121200 - GÜNAM 2. Aşama Global Mükemmeliyet ve Sanayi AraYüzü Oluşturulması, 2015 - 2020
- Turan R., Baker D. K. , Okutucu Özyurt H. T. , EU Framework Program Project, EU-Solaris, The European Solar Research Infrastructure for Concentrated Solar Power, 2012 - 2016

Citations

Total Citations (WOS):388

h-index (WOS):13