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AJAY KUMAR

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<http://biosystems.okstate.edu/Home/kajay/index.html>
<http://bioenergycenter.okstate.edu/faculty/Kumar>

EDUCATION

Ph.D., 2009, Agricultural and Biological Systems Engineering, University of Nebraska-Lincoln (UNL)
M.S., 2006, Agricultural and Biological Systems Engineering, UNL
B.Tech., 2003, Agricultural and Food Engineering, Indian Institute of Technology, Kharagpur, India

EMPLOYMENT HISTORY

Assistant Professor with 75% research and 25% teaching appointments, Department of Biosystems and Agricultural Engineering (BAE), OSU **6/2009-present**
Adjunct Assistant Professor, Department of Biological Systems Engineering (BSE), UNL **10/2009-present**
Graduate Research Assistant, Department of BSE, UNL 2003-2005 & 2006-2009
Engineering intern, Kellogg Company, Omaha, NE 5/2005-1/ 2006
Summer intern, GlaxoSmithKline Consumer Healthcare, Rajahmundry, India 5/2002-6/2002,

HONORS AND AWARDS

OSU Big 12 Faculty Fellowship, 2012
Competitive fellowship given to OSU faculty to advance collaborative research and scholarly activities with another Big 12 university.

USDA-NIFA Partnership Award for mission integration, 2011.
Nationally competitive team award given by United States Department of Agriculture – National Institute of Food and Agriculture (USDA NIFA) for integrating NIFA's missions of research, teaching and extension.

Graduate Student of the Year 2009, Mid-Central Conference of ASABE, 2009.
Scholarship given on a competitive basis to recognize graduate students who has contributed most to the scholarly work in agricultural engineering and related field in Mid-Central region of USA.

Graduate Fellowship, Office of Graduate Studies, UNL, 2007-08, 2008-09.
Fellowship given on a competitive basis to graduate students at UNL to recognize their scholarly activities.

John and Louise Skala Fellowship, UNL, 2004-05, 2005-06, 2006-07, 2007-08, 2008-09.
Fellowship given on a competitive basis to graduate students in College of Agriculture division of UNL to recognize their scholarly activities.

Milton-Mohr Graduate Fellowship, College of Engineering, UNL, 2005-06, 2006-07, 2008-09.
Fellowship given on a competitive basis to graduate students in College of Engineering division of UNL to recognize their scholarly activities.

Aquila Energy Sciences Fellowship, Aquila Inc., Nebraska University Foundation, Nebraska Center of Energy Science Research, UNL, 2007-08.
Fellowship given on a competitive basis to two graduate students at UNL to recognize their potential in contributing to biofuels and bioenergy research.

Bill A. and Rita L. Stout Outstanding International Graduate Student Award, Department of BSE, UNL, 2006-07.
Fellowship given on a competitive basis to an international graduate student of the department for contribution in departmental activities.

Raymond J. Tarleton Graduate Fellowship, American Association of Cereal Chemist International (AACC Intl.) Foundation, 2005-06.

Fellowship given on a competitive basis to graduate student members of AACC Intl. to recognize their scholarly activities in research to use of cereal grains for food and bioproducts.
Merit-Cum-Means scholarship, IIT Kharagpur, 1999-00, 2000-01, 2001-02, 2002-03.
Scholarship given on a competitive basis to students at IIT Kharagpur for supporting education.

PROFESSIONAL ACTIVITIES

Service in Professional Societies

American Society of Agricultural and Biological Engineers (ASABE, 2003 to present), American Society of Engineering Education (ASEE, 2011 to present), and American Institute of Chemical Engineers (AIChE, 2010 to present).
USDA multi-state committee, S-1041: The Science and Engineering for a Biobased Industry and Economy, 2010-present.
Associate Editor, Food and Process Engineering Division, ASABE journals “Transactions of the ASABE,” “Applied Engineering in Agriculture,” “the Journal of Agricultural Safety and Health,” and “Biological Engineering Transactions.”
Service in ASABE
Chair (2013-current), FPE (Food and Process Engineering)-709 Committee “Biomass Energy and Industrial Products.”
Vice Chair (2011-2013), FPE-709 Committee “Biomass Energy and Industrial Products.”
Organized 8 technical oral sessions for 2013 Annual International Meeting of ASABE.
Member, T-11 (Energy), BE-28 (Bioconversion and Bioprocess), SE-414 (Renewable Energy Power Generation Committee), FPE-04 (Publication Group), and FPE-01/02 (Executive & Steering).
Vice-Chair (2012-2013), Oklahoma-Section of ASABE.
Secretary and Treasurer (2011-2012), Oklahoma-Section of ASABE.
Organizing committee member of special session “Bioenergy Day” at the 2013 Annual International Meeting.
Proposed and organized an Invited session entitled “Industry Leaders in Thermochemical Conversion” at special session “Bioenergy Day” at the 2013 Annual International Meeting of ASABE in collaboration with Dr. Raymond Huhnke.
Proposed, organized and moderated an Invited session entitled “Industry Leaders in Thermochemical Conversion” at the 2012 Annual International Meeting of ASABE in collaboration with Dr. Kaushlendra Singh.
Moderated a technical session- “Biomass Catalytic & Thermochemical Conversion Processes- Gasification” at 2012 Annual International Meeting of ASABE.
Moderator, Technical session- “Biomass Catalytic & Thermochemical Conversion Processes- Gasification” at 2011 Annual International Meeting of ASABE.
Moderated a session “session III” at the 2012 annual meeting of Oklahoma section ASABE – Feb 17, 2012.
Committee member of a 2011 S-1041 symposium called “Where There’s Smoke, There’s Fuel”, a symposium on the thermochemical conversion of biomass to fuels.
Moderator, a technical session at the Oklahoma Section ASABE Meeting (Session II), Feb 26, 2010.
Judge, student poster competition at 2012 AIChE annual meeting in Pittsburgh, PA. 2012.
Judge, ASABE Mid-central student design paper competition, Apr 4-5, 2008.

Service as a Reviewer

Panel reviewer for USDA National Institute of Food and Agriculture (NIFA) Small Business Innovation Research (SBIR) 8.8 Biofuels and Biobased Products Program. Jan 17-19, 2012.
Panel reviewer for Sun Grant Program, 2012.
Ad-hoc proposal reviewer, Sun Grant Program, 2012.
Ad-hoc proposal reviewer, Sun Grant Program, 2013.

On-Site reviewer for USDA Biomass Research and Development Initiative (BRDI) project entitled “Solar-thermal Conversion of Cellulosic Biomass to Synthesis Gas”, University of Colorado, Boulder, CO, Dec 15-17, 2011.

External peer reviewer, a report entitled “Biomass Gasification: Characteristics of Biomass Feedstocks” to US DOE (Department of Energy) written by RAND Corporation, Dec 2011.

External peer reviewer of seven research proposals submitted to US-Department of Defense, Strategic Environmental Research and Development Program, May 2011.

External peer reviewer of a research proposal submitted to Estonian Science Foundation, Nov 23, 2011.

External peer reviewer of a conference proposal submitted to present at 2012 Central Hardwood Conference, Morgantown, WV.

Reviewer of a manuscript entitled “Gasoline-Range Hydrocarbon Production from Gasified Biomass using Bi0functional Catalysts through Alcohol Intermediates” for “Biofuels” journal for publication, Aug 12, 2011.

Panel reviewer for selection of best papers in FPE (Food and process Engineering) division of American Society of Agricultural and Biological Engineers (ASABE), 2011 and 2012.

Panel reviewer to evaluate preliminary proposals for 2010 Integrated Graduate Education (IGERT), National Science Foundation (NSF), June 2010.

Peer reviewer of journals: (1) *Biomass and Bioenergy*, (2) *Bioresource Technology*, (3) *International Journal of Hydrogen Energy*, (4) *Journal of Analytical and Applied Pyrolysis*, (5) *Journal of Biobased Materials and Bioenergy*, (6) *Industrial Engineering and Chemistry Research*, (7) *Transactions of ASABE*, (8) *Journal of Food Engineering*, (9) *Cereal Chemistry*, (10) *Fuel Cells*, (11) *Polymer International*, (12) *Energy and Fuels*, (13) *Fuel*, and (14) *Fuel Processing Technology*.

Editorial Board member of an open-access journal “*Journal of Sustainable Bioenergy Systems* (JSBS).”

Service in Department, College and University

Served as a member of following committees in the BAE Department
ABET (Accreditation Board for Engineering and Technology) and Undergraduate Curriculum Reappointment, Promotion and Tenure (2010-2011)

Awards

Undergraduate Student Recruitment, Placement, and Scholarship

Course Oversight Committees - Engineering Prefix Courses

Volunteered as a judge of undergraduate student BAE 4001 presentations, 2011, 2012, and 2013.

Nominated Dr. Mark Wilkins for ASABE’s Gale Holloway Professional Development Award, 2011.

Dr. Wilkins was selected for the award.

Nominated Dr. Hasan Atiyeh for OSU Sigma Xi Young Investigator Award, 2011.

Volunteer as an interviewer to evaluate scholarship applicants, College of Engineering, Architecture and Technology (CEAT), Spring 2010, 2011, and 2013.

Judge of 22nd Annual OSU Research Symposium and Research Scholar Conference, Stillwater, OK, 2011 and 2012.

Developed my faculty webpages for showcasing research and teaching.

Provided material to develop webpages to showcase research in biofuels.

Served as a co-advisor of OSU student club “Indian Students Organization (ISO)” – 2012-13.

Served as secretary in board of OSU faculty-staff organization “Asian American Faculty and Staff Association (AAFSAs).” Duties included preparing meeting minutes, newsletter and contribute in organizing events – 2012-14.

PROFESSIONAL DEVELOPMENT ACTIVITIES

- Attended OSU's ITLE seminars on Early Career Faculty Support Program
Planning for Reappointment, Promotion & Tenure (RPT) at OSU – Dr. Pamela Fry, Interim Provost, Oct 2, 2013.
- Participated in ITLE workshop “Provost's Initiative: Focus on General Education - Critical Thinking Workshop Series”, 2013.
- Attended OSU's Institute for Teaching and Learning Effectiveness (ITLE) seminars to improve teaching effectiveness including the following:
- ITLE Faculty Certificate Program: “Panel: Cases of creative teaching at OSU”, Nov 10, 2011
 - ITLE Faculty Certificate Program: “Is Critical Thinking Discipline general”, Oct 20, 2011
 - ITLE Faculty Certificate Program: “Helping students develop global competence”, Oct 19, 2011
 - ITLE Faculty Certificate Program: “Teaching Creatively for Creativity”, Sep 21, 2011.
 - ITLE-Difficult dialogue series: “Immigration issues”, Sep 28, 2011.
 - Leading from Within: Strategic Thinkers Series: “Perspectives of OSU Online from the Field”, Sep 15, 2011.
- Participated in Provost's Faculty Development Initiative entitled “Provost's Faculty Development Initiative: Integrating and Assessing Writing in Your Class”, a certificate program by Office of University Assessment and Testing, Office of Academic Affairs, and ITLE, 2012-2013.
- Took a six-week non-credit ITLE course “Preparing Online Instructors (POI) – Summer, 2012.
- Participated in Provost's Faculty Development Initiative entitled “Integrating and Assessing Writing in Your Class”, a certificate program by Office of University Assessment and Testing, Office of Academic Affairs, and ITLE, 2011-2012.
- Attended one-day “Write Winning Grants” seminar, Dr. Morrison, Stillwater, Sep 28, 2011.
- Attended USDA Teleseminar Series on Chemical Conversion Technologies organized by Dr. Robert Fireovid.
- Attended a US-DOE webinar “Transforming Biomass into Feedstock”, Aug 30, 2011.
- Attended a US-DOD webinar “DoD as a Renewable Energy Driver”, Jan 9, 2012.

TEACHING ACTIVITIES

As Instructor

- Developed and taught a new graduate course “BAE 5030-Biomass Thermochemical Conversions” course, Fall 2011 and 2012.
- Developed partial course materials for and taught a core undergraduate course: “BAE 1022- Experimental Methods in Biosystems Engineering” at OSU, Spring, 2011 and Spring 2012.
- Developed partial course materials for and taught a core undergraduate course: “BAE 3213- Energy and Power.” at OSU, Spring, 2010 Spring, 2011 and Spring 2012.

As Guest Lecturer

- Taught two lecture sessions on thermochemical conversion for “BAE 5213: Renewable Energy Engineering,” Fall 2009 and 2011.
- Taught a lecture session on thermochemical conversion for “PLNT 4573: Bioenergy Feedstock Production,” Fall 2009 and 2011 at OSU.
- Developed "gasification for bioenergy" lectures and laboratory for course “Principles of Bioprocess Engineering,” Spring 2006 at UNL.

As Teaching Assistant (TA)

- Served as a Teaching Assistant for course “Principles of Bioprocess Engineering,” Spring 2005 at UNL.
- Served as a Teaching Assistant for course “Heat and Mass Transfer,” Fall 2004 at UNL.

As Faculty Mentor/ TA Supervisor

Advised an OK-NSF-EPSCoR REU Scholar, 2012.
 Advised an OK- Louis Stokes Alliance for Minority Participation (OK-LSAMP) scholar, 2011.
 Advised three BAE 1012 course project teams involving 8 undergraduate students.
 Supervised two TAs in course: BAE 1022 Experimental Methods in Biosystems Engineering, 2011.
 Advised Honors Project, Whitney Lisenbee, BAE 1022 Experimental Methods in Biosystems Engineering, 2011.

Other Teaching Activities

Developed an educational workshop “Renewable energy demonstration” for 4-H Youth Development at OSU, summer of 2010 and 2011.
 Involved in development of an on-line graduate certificate "Biobased Products and Bioenergy," offered by Oklahoma State University, Kansas State University, University of Arkansas and South Dakota State University, and funded by USDA (United States Department of Agriculture).

Table 1. Courses Taught in 2013

Course	Term	Title	#Student	#Hr	Stu*Hr
BAE 3213-001	Spring	Energy and Power (Theory and Lab)	14	3	42
BAE 3213-002	Spring	Energy and Power (Theory and Lab)	12	3	36
BAE 1022-001	Spring	Experimental Methods (Theory and Lab)	10	2	20
BAE 1022-002	Spring	Experimental Methods (Theory and Lab)	21	2	42
BAE-5000-376	Summer	Thesis	1	-	3
BAE-6000-376	Summer	Thesis	3	-	9
BAE-6610-351	Summer	Advanced Research & Study	1	2	2
BAE-5000-377	Fall	Thesis	1	-	6
BAE-6000-374	Fall	Thesis	2	-	8

Table 2. Courses Taught in 2012

Course	Term	Title	#Student	#Hr	Stu*Hr
BAE 3213-001	Spring	Energy and Power (Theory and Lab)	22	3	66
BAE 3213-002	Spring	Energy and Power (Theory and Lab)	22	3	66
BAE 1022-001	Spring	Experimental Methods (Theory and Lab)	18	2	36
BAE 1022-002	Spring	Experimental Methods (Theory and Lab)	20	2	40
BAE 4400-361	Spring	Design of a Biomass Feeder	1	3	3
BAE 5000-375	Spring	Thesis	3	-	6
BAE 5030-353	Summer	Advanced Biopower Production	1	3	3
BAE 5000-376	Summer	Thesis	2	-	6
BAE 6000-376	Summer	Thesis	2	-	5
BAE 5030-354	Fall	Biomass Thermochemical Conversions	5	3	15
BAE 6610-352	Fall	Biomass Gasification Modeling	1	3	3
BAE 5000-377	Fall	Thesis	2	-	8
BAE 6000-378	Fall	Thesis	1	-	3

Table 3. Courses Taught in 2011

Course	Semester	Title	Enrollment	Hrs
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BAE 3213-001	Spring	Energy and Power (Theory and Lab)	12	3
BAE 3213-002	Spring	Energy and Power (Theory and Lab)	9	3
BAE 1022-001	Spring	Experimental Methods (Theory and Lab)	10	2
BAE 1022-002	Spring	Experimental Methods (Theory and Lab)	10	2
BAE 1022-003	Spring	Experimental Methods (Theory and Lab)	18	2
BAE 4400-361	Spring	Design of a Biomass Feeder	1	3
BAE 6000-376	Summer	Thesis	1	3
BAE 5000-376	Summer	Thesis	1	3
BAE 6000-378	Fall	Thesis	1	2
BAE 5030-355	Fall	Biomass Thermochemical Conversions	6	2

Table 4. Courses Taught in 2010

Course	Semester	Title	Enrollment	Hrs
BAE 3213-001	Spring	Energy and Power (Theory and Lab)	10	3
BAE 6000-376	Summer	Thesis	1	3
BAE 5000-376	Summer	Thesis	1	3
BAE 6000-378	Fall	Thesis	1	2

UNDERGRADUATE AND GRADUATE STUDENTS ADVISED OR SUPERVISED

Summary: Number of graduate students advised: 8 (3 PhD and 5 MS); Additional graduate students supervised on research projects: 13; Graduate student committees served: 12 (8 as chair); Undergraduate students advised on research projects: 9 (8 freshman and 1 senior); Postdoctoral scholars sponsored: 1.

Graduate Students Advised

Vamsee Pasangulapati Degree: MS, Graduation: May 2012
 Pushpak Bhandari* Degree: MS, Graduation: Dec, 2012
 Ashokkumar Sharma** Degree: PhD, Graduation: Oct, 2013
 Madhura Sarkar Degree: MS, Graduation: Dec, 2013
 George Manu Degree: MS, Expected Graduation: May, 2014
 Jacob Collins Degree: MS, Expected Graduation: May, 2014
 Kezhen Qian Degree: PhD, Expected Graduation: 2014
 Zixu Yang Degree: PhD, Expected Graduation: 2014
 Ram Isakki Degree: MS, Expected Graduation: May, 2015

*Fall 2012 Commencement Ceremony Honorary Graduate Marshal Awardee in MS category

**Fall 2013 Commencement Ceremony Honorary Graduate Marshal Awardee in PhD category to represent College of Engineering, Architecture and Technology

Undergraduate Students Advised

Onovwie O. Rachael NSF EPSCoR-REU, 2012
 Matt Duncan OK-LSAMP Scholar, 2010-2011
 Corey Seaman BAE-1012 project team member, 2011
 Andrew Craig BAE-1012 project team member, 2011
 Regulo Castaneda BAE-1012 project team member, 2011
 Sarah Burnes BAE-1012 project team member, 2010
 Josh Martin BAE-1012 project team member, 2010
 Logan Nightengale BAE-1012 project team member, 2010
 Kevin Roehm BAE-1012 project team member, 2009

Buck Rich BAE-1012 project team member, 2009

Graduate Students Supervised

Pratik Chaphekar	MS	Major: CS
Ranvir Pal	MS	Major: ECE
Deepak Padaliya	MS	Major: IEM
Mohit Dobhal	MS	Major: IEM
Shaswat Dixit	MS	Major: CHME
Karthiragunath Mariyappan	MS (Graduated, 2012)	Major: IEM
Nitesh Rentam	MS (Graduated, 2012)	Major: ECE
Akshata Mudinoor	MS (Graduated, 2011)	Major: BAE
Balaji Dhamodharan	MS (Graduated, 2011)	Major: IEM
Bipul Chandra	MS (Graduated, 2011)	Major: ECE
Raunak Uttekar	MS (Graduated, 2011)	Major: CIVE
Anagha Vitonde	MS (Graduated, 2011)	Major: CIVE
Siddharth Patil	MS (Graduated, 2010)	Major: CIVE
Bhavna Sharma	BAE-1022 TA, 2012	

Undergraduate Students Supervised

Tyler Zimbelman	BAE 3213 TA, 2013
Brian Biggerstaff	BAE 1022 TA, 2013
Levi Edens	BAE-3213 TA, 2012
Qualla Parman	BAE-1022 TA, 2012
Ryan Johnson	BAE-1022 TA, 2011
Kylea Boyd	BAE-1022 TA, 2011
Steve Jacob Huff	Supervisor
Mark Marshall	Supervisor
Tyler Zimbelman	Supervisor, 2012

Graduate Student Committee Served

As Chair

Vamsee Pasangulapati	MS, Graduated, 2012
Pushpak Bhandari	MS, Graduated, 2012
Ashokkumar Sharma	PhD, Graduated, 2013
Madhura Sarkar	MS
George Manu	MS
Jacob Collins	MS
Kezhen Qian	PhD
Zixu Yang	PhD
Ram Kumar Isakki	MS

As Committee Member

Prakash Bhoi	PhD	Major: Biosystems Engineering
Hanjing Wu	PhD	Major: Engineering at University of Nebraska, Graduated, 2013
Luz Marin	PhD	Major: Biosystems Engineering, Graduated, 2011
Akshata Mudinoor	MS	Major: Biosystems Engineering, Graduated, 2011

Post-doctoral scholar sponsored

Dr. Ali Rownaghi	2011-12
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COLLABORATORS & OTHER AFFILIATIONS

• **Collaborators and Co-Editors**

Hasan Atiyeh (Oklahoma State University), Danielle Bellmer (Oklahoma State University), Satish Bukkapatnam (Oklahoma State University), Sergio Capareda (Texas A& M University), Qi Cheng (Oklahoma State University), Eric Chan-Tin (Oklahoma State University), Yesar Demirel (University of Nebraska), Joseph Dumais (University of Nebraska), Kent Eskridge (University of Nebraska), Robert S. Frazier (Oklahoma State University), Girish Ganjyal (PepsiCo Inc.), Milford Hanna (University of Nebraska), Douglas Hamilton (Oklahoma State University), Sandip Harimkar (Oklahoma State University), Raymond Huhnke (Oklahoma State University), David Jackson (University of Nebraska), Carol Jones (Oklahoma State University), David Jones (University of Nebraska), Sundar Madhivaly (Oklahoma State University), George Meyer (University of Nebraska), Mudinoor Akshata (University of California Davis), Hossein Nouredini (University of Nebraska), Krushna N. Patil (Oklahoma State University), Heartwin Pushpadass (National Dairy Research Institute, India), Jaya S. Tumuluru (Idaho National Laboratory), R.G. Ramakumar (Oklahoma State University), Donghai Wang (Kansas State University), Lijun Wang (North Carolina A&T State University), Wayne Yuan (North Carolina State University), Randy Wehling (University of Nebraska), Curtis L. Weller (University of Nebraska), James R. Whiteley (Oklahoma State University) and Mark Wilkins (Oklahoma State University).

- **Graduate and Postdoctoral Advisors**

Graduate Advisors: Milford Hanna (University of Nebraska), and David D. Jones (University of Nebraska).

- **Thesis Advisor and Postgraduate-Scholar Sponsor**

Graduate Advisees: Vamsee Pasangulapati (CGI Group Inc.), Pushpak Bhandari (Purdue University), Ashokkumar Sharma (Iowa State University).

Postdoctoral Scholar: Ali Rownaghi (Georgia Institute of Technology).

GRANTS RECEIVED

Summary: Total Funding: \$7,524,646; Total external funding as PI: \$684,973; and Total external funding as PI or co-PI: \$7,391,258. External funding agencies: NSF, USDA, South Central Sun Grant Program, OK NSF EPSCoR, OK State Regents for Higher Education and Rentech Inc.

South Central Sun Grant Program. Atiyeh, H., **Kumar, A. (Co-PI)**, and Wilkins, M. Development of Sustainable Hybrid Gasification-Syngas Fermentation Process for Alcohol Production. \$136,000. 1/1/2014- 12/31/2015.

NSF. Research Experience for Undergraduates (REU) Site: Interdisciplinary Approach to Sustainable Biobased Products and Energy Development. Lancaster, S., Kakani G., **A. Kumar (Co-PI)** et al. 3/1/13 -2/28/16. \$296,842.

NSF, EPSCoR. Establishing critical infrastructure for fundamental research in biomass pyrolysis. **A. Kumar (PI)**, and R. L. Huhnke. \$95,995. 2013. Duration: July 1, 2013 – November 30, 2013.

NSF, EPSCoR. Novel Biocatalytic Approach for Upgrading of Pyrolysis Oil to Fuels and Chemicals. Atiyeh, H., **A. Kumar (Co-PI)** and C. Aichele. Total Funded: \$150,532. Duration: July 1, 2013 – November 30, 2013.

OSU Technology and Business Development Program (TBDP). Development of novel high-value bio-based nanocomposites. **Kumar, A. (PI)** and S. Harimkar. \$5,000. 5/2013-4/2014.

South Central Sun Grant Program. Developing a cost-effective technology for conditioning biomass-generated syngas with in-situ bed of biochar-based catalysts. **Kumar, A. (PI)**, K.N. Patil, and R.S. Frazier. 1/1/2013-12/31-2014. \$149,381.

OSU Center for Innovation and Economic Development, Inc. Instrumented Impact Testing Facility for Materials Research. Harimkar, S., **A. Kumar (Co-PI)**, and others. \$100,000. June 2012-May 2013.

- OSU Planning Grant for Establishing Interdisciplinary Programs. Building a Center for Integrated Renewable Energy Systems. Ramakumar, R., **A. Kumar (Co-PI)** and others. \$26,000. Jun 2012-Aug 2013.
- South Central Sun Grant Program. Value-added utilization of biochar in syngas clean-up and conditioning. **Kumar, A. (PI)**, K.N. Patil, D.D. Bellmer. A collaborative project with Wayne Yuan at North Carolina State University and Donghai Wang at Kansas State University. \$159,266 (\$79,266 to OSU). 7/1/2011-6/30-2013.
- South Central Sun Grant Program. Torrefaction and densification of switchgrass to improve syngas quality and transportation logistics. **Kumar, A. (PI)**, J.S. Tumuluru, K.N. Patil, D.D. Bellmer. \$83,241. 7/1/2011-6/30/2012.
- Oklahoma State Regents for Higher Education for NSF-EPSCoR project "Building Oklahoma's Leadership Role in Cellulosic Bioenergy." Wickstead, J., R. L. Huhnke, **A. Kumar (Co-PI)** et al. 2009-2013. \$5,500,000 (\$988,671 to Dr. Kumar).
- Hatch Project. Improving quality and yield of producer gas from biomass gasification by optimizing operating conditions and using heterogeneous catalysts. **Kumar, A. (PI)**. 2009-2014.
- NSF-EPSCoR (National Science Foundation- Experimental Program to Stimulate Competitive Research) Research Experience for Undergraduates. Biochar for Conditioning Biomass-Generated Syngas. **Kumar, A. (PI)**. \$5,000. May-Aug, 2012.
- OSU Big 12 Fellowship Program. Identification and characterization of the top 10 biomass feedstocks in Oklahoma and Texas for sustainable production of fuels, chemicals and power. **Kumar, A. (PI)**. \$2,388. 05/20/2012-06/1/2012.
- Rentech Inc., Bench-scale study of biomass steam reforming. **Kumar, A. (PI)**. \$39,406. 6/4/2012-12/31/12.
- USDA - National Institute of Food and Agriculture (NIFA). Project#2010-34447-20772. Biomass-based Energy Research. Huhnke, R. L., H. Atiyeh, D. Bellmer, **A. Kumar (Co-PI)**, R. Lewis, K. Patil, E. Columbus, R. Tanner, M. Wilkins F. Epplin and Y. Wu. \$780,831. July 1, 10- June 30, 13.

REFEREED JOURNAL PUBLICATIONS

Summary: Number of published (or accepted to publish) refereed publications: 22; Referred publications with senior author: 17 (8 as first author and 9 as corresponding author); Referred publications while at OSU: 15.

As of Jan 8, 2014, total citations: 389 (372 since 2009); h-index: 9

(Source: <http://scholar.google.com/citations?user=Dr3wLhgAAAJ&hl=en>)

While at OSU

In Review (* denotes corresponding author)

1. Madhura Sarkar, Ajay Kumar*, Jaya Shankar Tumuluru, Krushna N. Patil, and Danielle D. Bellmer. (**In Review**). Gasification Performance of Switchgrass Pretreated with Torrefaction and Densification. Applied Energy. Submitted Dec 4, 2013.
2. Sharma, Ashokkumar M., A. Kumar*, Sundar Madihally, Rob Whiteley and Raymond L. Huhnke. (**In Review, revision submitted**). Prediction of biomass-generated syngas using extents of major reactions in a continuous stirred-tank reactor. Energy. Revision submitted: Dec xx, 2013.

Published/accepted

1. Wang, Duo, Wenqiao Yuan*, Donghai Wang, and Ajay Kumar. (**Accepted**). A char-supported nano-NiO catalyst for biomass syngas cleanup and conditioning. Transactions of ASABE.
2. Bhandari, Pushpak N., A. Kumar*, and Raymond L. Huhnke. (**Accepted, available online in 2013**). Simultaneous removal of toluene (model tar), NH₃, and H₂S, from biomass-generated producer gas using biochar-based and mixed-metal oxide catalysts. Energy & Fuels.
3. Bhandari, Pushpak N., A. Kumar*, Danielle Bellmer, and Raymond L. Huhnke. (**Accepted**). Synthesis and evaluation of biochar-derived catalysts for removal of toluene (model tar) from biomass-generated producer gas. Renewable Energy. doi:10.1016/j.renene.2013.12.017.

4. Sarkar, Madhura, A. Kumar*, Jaya Shankar Tumuluru, Krushna Patil, and Danielle Bellmer (*Accepted*). Thermal Devolatilization Kinetics of Switchgrass Pretreated with Torrefaction and Densification. Special Issue of Transactions of ASABE.
5. Penn, Chad*, Derek. Heeren, Garey Fox, and A. Kumar (In Press). Application of isothermal calorimetry to phosphorus sorption onto soils in a flow-through system. Soil Science Society of America Journal. In Press. doi:10.2136/sssaj2013.06.0239.
6. Sharma, Ashokkumar, M. A. Kumar*, and Raymond L. Huhnke. **2014 (available online in 2013)**. Effect of steam injection location on syngas obtained from an air-steam gasifier. *Fuel*. 388-394. (Accepted, journal's 2012 impact factor: 3.357, and 5-year impact factor: 4.059).
7. Qian, Kezhen, A. Kumar*, Krushna Patil, Danielle Bellmer, Donghai Wang, Wenqiao Yuan, and Raymond L Huhnke. **2013**. Effects of biomass feedstocks and gasification conditions on the physiochemical properties of biochar. *Energies*. 6: 3972-3986. (Journal's 2012 impact factor: 1.844, and 5-year impact factor: 2.087)
8. Sharma, A. M., A. Kumar*, K. N. Patil, and R. L. Huhnke. **2013**. Fluidization characteristics of a mixture of gasifier solid residues, switchgrass and inert material. *Powder Technology*. 235: 661-668. (Journal's 2012 impact factor: 2.024, and 5-year impact factor: 2.265)
9. Pasangulapati, V., A. Kumar*, C. L. Jones, and R. L. Huhnke. **2012**. Characterization of switchgrass, cellulose, hemicellulose and lignin for thermochemical conversions. *Journal of Biobased Materials and Bioenergy*. 6(3):249-258.
10. Pasangulapati, V., K. D. Ramachandriya, A. Kumar*, M. R. Wilkins, C. L. Jones, and R. L. Huhnke. **2012**. Effects of cellulose, hemicellulose and lignin on thermochemical conversion characteristics of the selected biomass. *Bioresource Technology*. 114: 663-669. (Journal's 2012 impact factor: 4.750, and 5-year impact factor: 5.172)
11. Sharma, A. M., A. Kumar*, K. N. Patil, and R. L. Huhnke. **2011**. Performance evaluation of a lab-scale fluidized bed biomass gasifier using switchgrass as feedstock. *Transactions of ASABE*. 54(6):2259-2266.
12. Mudinoor, A. R., D. D. Bellmer*, L. Marin, A. Kumar, and R. Huhnke. **2011**. Conversion of toluene (model tar) using selected steam reforming catalysts. *Transactions of ASABE*. 54(5):1819-1827.
13. Kumar, A., Y. Demirel, D. D. Jones, and M. A. Hanna*. **2010**. Optimization and economic evaluation of industrial gas production and combined heat and power generation from gasification of corn stover and distillers grains. *Bioresource Technology*. 101(2010):3696-3701. (Journal's 2012 impact factor: 4.750, and 5-year impact factor: 5.172)
14. Kumar, A., D. D. Jones, and M. A. Hanna*. **2009**. Thermochemical biomass gasification: A review of the current status of the technology. *Energies*. 2(3):556-581. (Journal's 2012 impact factor: 1.844, and 5-year impact factor: 2.087)
15. Kumar, A., Y. Demirel, H. Noureddini, D. D. Jones, and M. A. Hanna*. **2009**. Simulation of corn stover and distillers grains gasification with Aspen Plus. *Transactions of ASABE*. 52(6):1989-1995.

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16. Kumar, A., K. Eskridge, D. D. Jones, and M. A. Hanna*. **2009**. Steam-air fluidized bed gasification of distillers grains: effects of steam to biomass ratio, equivalence ratio and gasification temperature. *Bioresource Technology* 100(6):2062-2068. (Journal's 2012 impact factor: 4.750, and 5-year impact factor: 5.172)
17. Wang, L., A. Kumar, C. L. Weller, M. A. Hanna, and D. D. Jones. **2009**. Thermal degradation kinetics of distillers grains in nitrogen and air. *Energy Sources, Part A: Recovery, Utilization, and Environmental Effects* 31(10):797-806.
18. Pushpadass, H., A. Kumar, D. Jackson, R. Wehling, J. Dumais, and M. A. Hanna*. **2009**. Macromolecular changes in extruded starch-films plasticized with glycerol, water and stearic acid. *Starch* 5(5):256-266. (Journal's 2012 impact factor: 1.22)

19. Kumar, A., L. Wang, D. Yuris, D. D. Jones, and M. A. Hanna*. **2008**. Thermogravimetric characterization of corn stover as gasification and pyrolysis feedstock. *Biomass and Bioenergy* 32:460-467. (Journal's 2012 impact factor: 2.975, and 5-year impact factor: 3.931)
20. Kumar, A., G. M. Ganjyal, D. D. Jones, and M. A. Hanna*. **2008**. Modeling residence time distribution in a twin-extruder as a series of ideal steady-state flow reactors. *Journal of Food Engineering* 84:441-448. (Journal's 2012 impact factor: 2.276, and 5-year impact factor: 2.976)
21. Kumar, A., G. M. Ganjyal, D. D. Jones, and M. A. Hanna*. **2007**. Experimental determination of longitudinal expansion during extrusion of starches. *Cereal Chemistry* 84(5):480-484.
22. Kumar, A., G. M. Ganjyal, D. D. Jones, and M. A. Hanna*. **2006**. Digital image processing for measurement of residence time distribution in a laboratory extruder. *Journal of Food Engineering* 75(2): 237-244. (Journal's 2012 impact factor: 2.276, and 5-year impact factor: 2.976)

BOOK CHAPTER (IN REVIEW)

1. Kumar, A*. R. Huhnke. **2013 (In Press)**. Biomass thermochemical conversions Technologies for production of fuels, chemicals and power. In "Switchgrass." Edited by Dr. Hong Luo. CRC Press of Taylor and Francis Group (Florida).
2. Kumar, A*. A. K. Sharma, P. Bhandari. **2013 (In Press)**. Biomass Gasification and Syngas Utilization. In "Sustainable Bioenergy Production." Edited by Dr. Lijun Wang. CRC Press of Taylor and Francis Group.
3. Kumar, A*. A. K. Sharma, R. Frazier. **2014 (In Review)**. In "Driving the Future: Advances in Cellulosic Ethanol and Advanced Drop-In Biofuels." Edited by Blake Simmons. Future Science Group.

TECHNICAL REPORTS

1. Kumar, A. K. N. Patil and R. L. Huhnke. 2010, 2011, 2012, and 2013 annual reports and highlights of one aim for the OK NSF EPSCoR project "Building Oklahoma's Leadership Role in Cellulosic Bioenergy."
2. Kumar, A. R. L. Huhnke. 2011, 2012 and 2013 annual reports for USDA S-1041 committee "The Science and Engineering for a Biobased Industry and Economy."

CONFERENCE PROCEEDINGS

1. Kumar, A., Qian, K., Patil, K., and Huhnke, R.L. 2012. Effects of Biomass Feedstocks, Gasifier Design and Conditions on Physiochemical Properties of Biochar. Proceedings from Sun Grant National Conference: Science for Biomass Feedstock Production and Utilization, New Orleans, LA. Retrieved from www.sungrant.tennessee.edu/NatConference/.

OSU INVENTION DISCLOSURES

1. Kumar, A.*, A. K. Sharma, W. Kiner, and R. Huhnke. Single screw gravity feeder for injecting low density and low flow-ability powdery biomass material. Submitted – Feb, 2013.
2. Kumar, A.*, and S. Harimkar. Starch and Polylactic Based Reinforced Biopolymer Composites. Submitted – Feb, 2013.

GRADUATE STUDENT (MY ADVISEE) THESIS

1. Sarkar, Madhura. 2013. Title: Effects of torrefaction and densification on devolatilization kinetics and gasification performance of switchgrass. Dec, 2013.
2. Sharma, Ashokkumar. 2013. Title: Experimental Investigation and simulation of a fluidized-bed gasifier using switchgrass. Dec, 2013.
3. Bhandari, Pushpak. 2012. Title: Synthesis and evaluation of novel biochar-based and metal oxide-based catalysts for removal of model tar (toluene), NH₃, and H₂S from simulated producer gas.
4. Pasangulapati, Vamsee. 2012. Title: Devolatilization characteristics of cellulose, hemicellulose, lignin and the selected biomass during thermochemical gasification: experiment and modeling studies.

PRESENTATIONS

Summary: Total number of presentations: 61; Invited presentations: 5; Presentations while at OSU: 50.

While at OSU

Abstracts Submitted for 2014 conferences

- i. Zixu Yang, Ajay Kumar*, Raymond L. Huhnke, Mike Buser, Sergio Capareda. Pyrolysis of Eastern Redcedar in a fluidized-bed and a drop-tube reactors for Bio-oil Production. ACS National Meeting, Dallas, Texas, March 16-20, 2014.
- ii. Cody Collins, Ajay Kumar*, Biofuels from Food Wastes: Thermal Degradation Properties of Carbohydrates, Fats and Proteins. ACS National Meeting, Dallas, Texas, March 16-20, 2014.
- iii. Kezhen Qian, Ajay Kumar*. Reforming of Naphthalene and Anthracene as Model Tar using Char-supported Nickel Catalyst. ACS National Meeting, Dallas, Texas, March 16-20, 2014.
- iv. Madhura Sarkar, Ajay Kumar*, Jaya Shankar Tumuluru, Krushna Patil and Danielle Bellmer. Effects of torrefaction and densification on syngas generated from switchgrass gasification. ASABE International Meeting, July 13 – 16, 2014, Montreal, Quebec Canada.
- v. Kezhen Qian, Ashokkumar M. Sharma, Ajay Kumar*, Raymond L. Huhnke. Conditioning of biomass-generated syngas using biochar and biochar-based catalysts. ASABE International Meeting, July 13 – 16, 2014, Montreal, Quebec Canada.
- vi. Prakash R. Bhoi, Krushna N. Patil, Ajay Kumar and Raymond L. Huhnke*. Performance of vegetable oil based wet scrubbing system for the removal of producer gas tars. ASABE International Meeting, July 13 – 16, 2014, Montreal, Quebec Canada.
- vii. Prakash R. Bhoi, Krushna N. Patil, Ajay Kumar and Raymond L. Huhnke*. Design, fabrication and evaluation of vegetable oil based wet scrubbing system for the removal of biomass producer gas tars. ASABE International Meeting, July 13 – 16, 2014, Montreal, Quebec Canada.

Invited Presentations

1. Kumar, A*. 2013. Cleaning Biomass-Generated Syngas: Is Biochar a Cheaper Alternative to Expensive Catalysts? Annual State Conference of Oklahoma EPSCoR, Stillwater, OK, Apr 23, 2013.

Invited Presentation.

2. Kumar, A.*, K.N. Patil, and R. L. Huhnke. 2011. Biomass gasification and gas conditioning for production of power, fuels and chemicals. S-1041: Where there's smoke, there's fuel: A symposium on the Thermochemical Conversion of Biomass to Fuels, Stillwater, OK, August 2, 2011. ***Invited Presentation.***
3. Kumar, A.*, and K.N. Patil. Biomass Gasification: Improving yield and quality of producer gas. EPSCoR monthly teleconference, Stillwater, OK, Sep 15, 2010. ***Invited Presentation.***
4. Kumar A.*. Thermochemical gasification research at OSU. Annual State Conference of Oklahoma EPSCoR, Norman, OK, Apr 29, 2010. ***Invited Presentation.***
5. Huhnke, R.L.* , and Kumar, A. Bioconversion Pathways: Thermochemical Options and Developments. Presentation with abstract at the 2010 Pacific Rim Summit, Honolulu, HI, Dec 11-14, 2010. ***Invited Presentation.***

Conference Oral/Poster Presentations with Published Abstracts (*denotes corresponding author and **Bold** denotes the presenter.)

6. **Sharma, A. M., A. Kumar***, and R. L. Huhnke. 2013. CFD-based gasification model incorporating fluidization hydrodynamics and reaction kinetics. 2013 ASABE Annual International Meeting. July 21-24, 2013 in Kansas City, MO. Oral Presentation.
7. **Sharma, A. M., A. Kumar***, and R. L. Huhnke. Reaction kinetics-based gasification model using a continuous stirred-tank reactor (CSTR). 24th Annual OSU Research Symposium and Research Scholar Conference, Stillwater, OK, Feb 20-22, 2013. Oral Presentation.

8. Sarkar, M., **Kumar, A.***, Tumuluru, J. S., Patil, K. N., Bellmer, D., Huhnke, R. Effects of torrefaction and densification on quality of syngas generated from fluidized-bed gasification of switchgrass. Kansas city, Missouri. July 21-24, 2013. Poster Presentation.
9. **Sarkar, M., Kumar, A.***, Tumuluru, J. S., Patil, K. N., Bellmer, D., Huhnke, R. Effects of torrefaction and densification on quality of syngas generated from fluidized-bed gasification of switchgrass. OSU Research Symposium. Stillwater, Oklahoma. February 20-22, 2013.
10. **Yang, Z., A. Kumar***, M. Buser, R. L. Huhnke, S. Capareda. 2013. Influence of operation conditions on fast pyrolysis of eastern red cedar. 2013 ASABE Annual International Meeting. July 21-24, 2013 in Kansas City, MO. Oral Presentation.
11. **Qian, K., A. Kumar***, and R. L. Huhnke. 2013. Structural characterization of biochar by spectroscopy techniques. 2013 ASABE Annual International Meeting. July 21-24, 2013 in Kansas City, MO. Oral Presentation.
12. **Kumar, A.***, P. Bhandari, and R. L. Huhnke. 2013. Biochar-based and mixed-metal oxide catalysts for simultaneous removal of toluene (model tar), NH₃, and H₂S, from biomass-generated producer gas. 2013 ASABE Annual International Meeting. July 21-24, 2013 in Kansas City, MO. Oral Presentation.
13. Bhandari, P. N., **A. Kumar***, and R. L. Huhnke. Simultaneous Removal of Biomass-Generated Syngas Contaminants Using Biochar-Based Catalysts. 2012 AIChE Annual Meeting, Oct 28 – Nov 2, 2012 in Pittsburgh, PA. Oral Presentation.
14. Qian, K., **A. Kumar***, D.D. Bellmer, K.N. Patil and R. L. Huhnke. Sun Grant Initiative 2012 National Conference. Oct 2-5, 2012 in New Orleans, LA. Oral Presentation.
15. Sharma, A., **A. Kumar***, R. L. Huhnke. Effect of steam injection location on biomass-generated producer gas in a fluidized-bed gasifier. 2012 S-1041 meeting and symposium. Aug 6-7, 2012 in Washington, DC. Poster Presentation.
16. **Qian, K., A. Kumar***, R. L. Huhnke. 2012. Conditioning of biomass derived syngas over char supported catalyst. Abstracts Submitted. 2012 ASABE Annual International Meeting. Jul 29 – Aug 1, 2012 in Dallas, TX. Oral Presentation.
17. **Bhandari, P. N., A. Kumar***, D. D. Bellmer, and R. L. Huhnke. 2012. Review on using Carbon based Catalysts for Removal of Contaminants in Biomass-Generated Syngas. 2012 ASABE Annual International Meeting. Jul 29 – Aug 1, 2012 in Dallas, TX. Poster Presentation.
18. **Bhandari, P. N., A. Kumar***, D. D. Bellmer, and R. L. Huhnke. 2012. Synthesis and Evaluation of Biochar derived Activated Carbon for the Removal of Tar from Biomass Generated Syngas. 2012 ASABE Annual International Meeting. Jul 29 – Aug 1, 2012 in Dallas, TX. Oral Presentation.
19. **Sharma, A. M., A. Kumar***, and R. L. Huhnke. 2012. In-situ refining of producer gas from fluidized bed gasification of switchgrass. 2012 ASABE Annual International Meeting. Jul 29 – Aug 1, 2012 in Dallas, TX. Oral Presentation.
20. **Sharma, A. M., A. Kumar***, and R. L. Huhnke. 2012. Modeling switchgrass gasification with ASPEN Plus. 2012 ASABE Annual International Meeting. Jul 29 – Aug 1, 2012 in Dallas, TX. Oral Presentation.
21. **Miller, Elizabeth**, J. Dooley, M. Buser*, A. Kumar, R. Huhnke, and M. Sarkar. 2012. Characteristics differences between Eastern Red Cedar (*Juniperus virginiana*) heartwood and sapwood. 2012 ASABE Annual International Meeting. Jul 29 – Aug 1, 2012 in Dallas, TX. Oral Presentation.
22. **Huhnke, R.L.***, H. K. Atiyeh, **A. Kumar**, K. N. Patil, M. R. Wilkins, D. D. Bellmer, R. S. Tanner, B. S. Stevenson, and R. S. Lewis. 2012. Hybrid thermochemical-biochemical processing for biofuels, biochemical, and biopower. Biomass 2012: Confronting Challenges, Creating Opportunities. Hosted by the U.S. Department of Energy in Washington, DC. Jul 10-11, 2012. Poster Presentation.
23. **Sharma, A. M., A. Kumar***, and R. L. Huhnke. 2012. Effect of steam injection location on syngas generated from fluidized-bed gasification of switchgrass. Annual State Conference of Oklahoma EPSCoR. April 10, 2012 in Stillwater, OK. Oral and Poster Presentation.

24. **Bhandari, P. N., A. Kumar***, D. D. Bellmer, and R. L. Huhnke. 2012. Biochar and biochar-derived activated carbon as catalysts for syngas tar removal. Annual State Conference of Oklahoma EPSCoR. April 10, 2012 in Stillwater, OK. Oral and Poster Presentation.
25. **Bhoi, P., K.N. Patil, A. Kumar, and R. L. Huhnke***. 2012. Solubility of major producer gas tar compounds in water. Annual State Conference of Oklahoma EPSCoR. April 10, 2012 in Stillwater, OK. Oral and Poster Presentation.
26. **Rownaghi, A.***, **A. Kumar**, and R. L. Huhnke. 2011. Catalytic Hot-Gas Cleaning of Biomass Derived Syngas by CaMgO Nanocrystals. AIChE Annual Meeting, Minnesota, MN, Oct 20, 2011. Oral Presentation.
27. **Bhandari, P. N., A. Kumar***, K. N. Patil, and R. L. Huhnke. 2011. A Review of Contaminants in Producer Gas from Biomass Gasification. Annual International Meeting of American Society of Agricultural and Biological Engineers (ASABE), Louisville, KY, August 7-10, 2011. Poster Presentation.
28. **Bhandari, P. N., A. Kumar***, K. N. Patil, and R. L. Huhnke. Sampling, measurement and treatment of trace contaminants in producer gas from biomass gasification. Annual International Meeting of American Society of Agricultural and Biological Engineers (ASABE), Louisville, KY, August 7-10, 2011. Oral Presentation.
29. **Pasangulapati, V., A. Kumar***, C. L. Jones, and R. L. Huhnke. Effect of biomass composition on products in thermochemical conversion. Annual International Meeting of American Society of Agricultural and Biological Engineers (ASABE), Louisville, KY, August 7-10, 2011. Oral Presentation.
30. **Sharma, A. M., A. Kumar***, and R. L. Huhnke. 2011. Fluidization characteristics of a mixture of gasifier residues, chopped switchgrass and inert bed material. Annual International Meeting of American Society of Agricultural and Biological Engineers (ASABE), Louisville, KY, August 7-10, 2011. Oral Presentation.
31. **Sharma, A. M., A. Kumar***, and R. L. Huhnke. The effect of steam port location on producer gas from air-steam gasification of switchgrass. Annual International Meeting of American Society of Agricultural and Biological Engineers (ASABE), Louisville, KY, August 7-10, 2011. Oral Presentation.
32. **Bhandari, P. N., A. Kumar***, and R. L. Huhnke. Characterization and Testing of Catalyst for Removal of Ammonia and Hydrogen Sulfide from Biomass Gasification Gas. S-1041: Where there's smoke, there's fuel: A symposium on the Thermochemical Conversion of Biomass to Fuels, Stillwater, OK, August 2, 2011.
33. **Pasangulapati, V., A. Kumar***, C. L. Jones, and R. L. Huhnke. Effect of biomass composition on products in thermochemical conversion. S-1041: Where there's smoke, there's fuel: A symposium on the Thermochemical Conversion of Biomass to Fuels, Stillwater, OK, August 2, 2011. Poster Presentation.
34. **Sharma, A. M., A. Kumar***, and R. L. Huhnke. Effect of bed composition on fluidization for switchgrass gasification. S-1041: Where there's smoke, there's fuel: A symposium on the Thermochemical Conversion of Biomass to Fuels, Stillwater, OK, August 2, 2011. Poster Presentation.
35. **Sharma, A. M., A. Kumar***, and R. L. Huhnke. Fluidization characteristics of a mixture of chopped switchgrass, gasifier solid residues and silica sand. Annual State Conference of Oklahoma EPSCoR, Norman, OK, April 21, 2011. Oral and Poster Presentation.
36. **Pasangulapati*, V., A. Kumar***, C. L. Jones, and R. L. Huhnke. Characterization of switchgrass using TGA-FTIR for thermochemical conversion. Annual State Conference of Oklahoma EPSCoR, Norman, OK, April 21, 2011. Oral and Poster Presentation.
37. **Pasangulapati, V., A. Kumar***, C. L. Jones, and R. L. Huhnke. Characterization of switchgrass using TGA-FTIR for thermochemical conversion. 22nd Annual OSU Research Symposium and Research Scholar Conference, Stillwater, OK, Feb 23, 2011. Oral Presentation

38. **Sharma, A. M., A. Kumar***, and R. L. Huhnke. Fluidization-hydrodynamics of a mixture of gasifier residues, chopped switchgrass and bed materials. 22nd Annual OSU Research Symposium and Research Scholar Conference, Stillwater, OK, Feb 23, 2011. Oral Presentation.
39. **Sharma, A. M., A. Kumar***, K. N. Patil, and R. L. Huhnke. The effect of air-steam injection on performance of laboratory scale fluidized bed biomass gasifier. Annual international meeting of ASABE, Pittsburgh, PA, June 20-June 23, 2010. Oral Presentation.
40. **Kumar, A.***, A. Mudinoor, H. K. Atiyeh, D. D. Bellmer, and R. L. Huhnke. Development of a Catalytic Reactor for Conditioning of Biomass Generated Producer Gas and Evaluation of Selected Commercial Catalysts. 2010 AIChE Annual Meeting, Salt lake city, UT, Nov 7-Nov 12, 2010. Oral Presentation.
41. **Sharma, A. M., A. Kumar***, K. N. Patil, and R. L. Huhnke. Performance of a laboratory-scale fluidized-bed biomass gasifier. Symposium on Thermal and Catalytic Sciences for Biofuels and Biobased Products, Ames, Iowa, September 21 - September 23, 2010. Poster Presentation.
42. **Sharma, A. M., A. Kumar***, K. N. Patil, and R. L. Huhnke. Design and performance evaluation of a lab-scale fluidized bed gasifier. Annual international meeting of ASABE, Pittsburgh, PA, June 20-June 23, 2010. Poster Presentation.
43. **Sharma, A. M., A. Kumar***, and R. L. Huhnke. Recent trends in fluidized-bed biomass gasification technology: A literature review. Annual international meeting of ASABE, Pittsburgh, PA, June 20-June 23, 2010. Oral Presentation.
44. **Sharma*, A. M., A. Kumar***, K. N. Patil, and R. L. Huhnke. Design and development of a new lab-scale fluidized bed gasifier. Annual State Conference of Oklahoma EPSCoR, Norman, OK, April 29, 2010. Poster Presentation.
45. **Pasangulapati, V., A. Kumar***, C. L. Jones, and R. L. Huhnke. Characterization of switchgrass using TGA-FTIR for thermochemical conversion. Symposium on Thermal and Catalytic Sciences for Biofuels and Biobased Products, Ames, Iowa, September 21-23, 2010. Poster Presentation.
46. **Kumar, A.***, K. N. Patil, D. D. Bellmer, and R. L. Huhnke. Effects of biomass and air flowrates on fluidized-bed gasification of switchgrass: Preliminary analysis. Bioenergy Engineering Conference of American Society of Agricultural and Biological Engineers (ASABE), Bellevue, WA, Oct 11-Oct 14, 2009. Poster Presentation.
47. **Kumar, A.**, D. D. Jones, and M. A. Hanna*. Integrated model of thermochemical biomass gasification for generating combined heat and power. Annual international meeting of American Society of Agricultural and Biological Engineers (ASABE), Reno, NV, June 21-June 24, 2009. Poster Presentation.
48. **Kumar, A.**, D. D. Jones, and M. A. Hanna*. Tar reduction in thermochemical biomass gasification. Annual international meeting of ASABE, Reno, NV, June 21-June 24, 2009. Poster Presentation.
49. **Kumar, A.**, Y. Demirel, D. D. Jones, and M. A. Hanna*. Simulation of Corn Stover Gasification. UNL Research Fair, Lincoln, NE, Apr 14-16, 2009. Oral Presentation.
50. **Kumar, A.**, Y. Demirel, D. D. Jones, and M. A. Hanna*. Modeling of fluidized bed steam-air gasification of biomass. Annual international meeting of American Society of ASABE, Providence, RI, June 29-July 2, 2008. Paper number: 084523. Oral Presentation.

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51. **Kumar, A.**, L. Isom, D. D. Jones, and M. A. Hanna*. Availability of corn in Nebraska after consumption by ethanol and livestock industry. Corn Utilization and Technology Conference (CUTC), Kansas City, KS, June 2-4, 2008. Poster Presentation.
52. **Kumar, A.**, K. Eskridge, D. D. Jones, and M. A. Hanna*. Steam-air fluidized bed gasification of distillers grains. Annual international meeting of ASABE, Providence, RI, June 29-July 2, 2008. Paper number: 084521. CUTC, Kansas City, KS, June 2-4, 2008. Oral Presentation.
53. **Kumar, A.**, L. Wang, D. Yuris, D. D. Jones, and M. A. Hanna*. Thermogravimetric characterization of corn stover as gasification/pyrolysis feedstock. Annual international meeting of ASABE, Minneapolis, MN, June 17-20, 2007. Paper number: 076146.

54. L. Wang*, A. Kumar, C. L. Weller, M. A. Hanna, and D. D. Jones. Co-production of chemicals and energy from distillers grain using supercritical fluid extraction and thermochemical conversion technologies. Annual international meeting of ASABE, Minneapolis, MN, June 17-20, 2007. Paper number: 076064.
55. Kumar, A., G. M. Ganjyal, D. D. Jones, and M. A. Hanna*. Online determination of longitudinal expansion during extrusion of starch. CUTC, Dallas, TX, June 5-7, 2006.
56. Kumar, A., D. D. Jones, and M. A. Hanna*. Dimensional analysis with rule-based fuzzy inference system to predict pressure, energy consumption and mean residence time in twin-screw extruder. Annual meeting of AACC Intl., Orlando, FL, Sept 11-14, 2005.
57. Kumar, A., D. D. Jones, and M. A. Hanna*. Effect of system parameters on molecular degradation kinetics of corn starch in a twin-screw extruder. Annual meeting of AACC Intl., Orlando, FL, Sept 11-14, 2005.
58. Kumar, A., G. M. Ganjyal, D. D. Jones, and M. A. Hanna*. Modeling residence time distribution in a twin-extruder as a series of ideal steady-state flow reactors. Annual meeting of AACC Intl., San Diego, CA, Sept 19-22, 2004.
59. Kumar, A., G. M. Ganjyal, D. D. Jones, and M. A. Hanna*. Measurement of expansion and residence time distribution in extruder using image processing and conductivity analysis. CUTC, Indianapolis, IN, June 7-9, 2004 and Sigma Xi student poster competition, UNL, Lincoln, NE, March 11, 2005.

Other Presentations

60. Kumar, A.*, and K. N. Patil. Gasification research updates. Joint meeting of Oklahoma State University and Mississippi State University for strengthening research collaboration, Mar 11, 2010. Oral Presentation.
61. Kumar, A.*. Updates on gasification research at OK NSF EPSCoR Biofuels Research Winter Retreat, Dec 6, 2010. Oral Presentation.