

# Applied Science & Technology Source Database Coverage List

Applied Science & Technology Source also includes all titles indexed in Applied Science & Technology Index Retrospective: 1913-1983 (H.W. Wilson).

"Core" coverage refers to sources which are indexed and abstracted in their entirety (i.e. cover to cover), while "Priority" coverage refers to sources which include only those articles which are relevant to the field.

**Please Note:**

Publications included on this database are subject to change without notice due to contractual agreements with publishers. Coverage dates shown are the intended dates only and may not yet match those on the product. All coverage is cumulative. Due to third party ownership of full text, EBSCO Information Services is dependent on publisher publication schedules (and in some cases embargo periods) in order to produce full text on its products.

Coverage Policy	Source Type	ISSN / ISBN	Publication Name	Publisher	Indexing & Abstracting Start	Indexing & Abstracting Stop	Full Text Start	Full Text Stop	Full Text Delay (months)	Peer-Reviewed	PDF Images (full page)	Image Quick-View	Searchable References Start	Cited References Stop
Core	Academic Journal	2153-4721	(m) Marine Technology	Society of Naval Architects & Marine Engineers	01/04/2010					Y				
Core	Magazine	1539-5251	.net Magazine	Fawcett Technical Publications	01/01/2003	31/10/2003								
Core	Conference Proceedings Collection		14th International Conference on POF (POF 2005) Proceedings	IGI Group Inc.	01/01/2005	31/01/2005	01/01/2005	31/01/2005						
Core	Book / Monograph	9781602670044	3G Wireless Technology Quick Guide	Jevin Technologies, Inc.	01/10/2007	31/10/2007	01/10/2007	31/10/2007			Y			
Core	Magazine	0744-7868	80 Micro	ZDNet (Ziff-Davis Publishing)	01/01/1985	30/06/1988								
Priority	Magazine	0567-3933	A.M.S. Archives of Industrial Health.	Journal Collection (H.W. Wilson)	01/01/1950	01/06/1960								
Core	Academic Journal	0149-1423	AAPG Bulletin	American Association of Petroleum Geologists	01/09/1976					Y				
Core	Academic Journal	1532-8813	AATCC Review	American Association of Textile Chemists & Colorists	01/01/2001					Y				
Core	Pamphlet		ABC's of Nuclear Science: Nuclear Structure	Lawrence Berkeley National Laboratory	01/01/2001	31/01/2001	01/01/2001	31/01/2001						
Core	Pamphlet		ABC's of Nuclear Science: Radioactivity	Lawrence Berkeley National Laboratory	01/01/2001	31/01/2001	01/01/2001	31/01/2001						
Core	Pamphlet		ABC's of Nuclear Science: Reactions	Lawrence Berkeley National Laboratory	01/01/2001	31/01/2001	01/01/2001	31/01/2001						
Priority	Trade Publication	1051-5526	Aberdeen's Concrete Construction	Hanley-Wood, Inc.	01/02/1990	01/03/2001	01/01/2000	01/01/2001						
Core	Trade Publication	1087-2302	ABQ Correspondent	ABQ Communications Corporation	01/02/2007		01/02/2007				Y			
Priority	Magazine	0190-2946	Academe	American Association of University Professors	01/01/1979	01/03/1983								
Core	Academic Journal	1583-7904	Academic Journal of Manufacturing Engineering	Academic Association for Manufacturing Engineering	01/03/2011		01/03/2011			Y	Y			
Core	Magazine		Access Advisor	Advisor Media Inc	01/01/2005	31/12/2005								
Core	Magazine	1093-9105	Access-VB-SQL Advisor	Advisor Media Inc	01/01/2003	31/12/2004								
Core	Trade Publication	0001-4664	Accountancy	Wolters Kluwer UK	01/01/1965									
Core	Magazine	0001-4672	Accountancy Age	Incisive Financial Publishing	26/05/2005	31/03/2011								
Priority	Magazine	0001-4710	Accountant (London).	Journal Collection (H.W. Wilson)	01/10/1939	01/10/1939								
Core	Trade Publication	1068-6452	Accounting Technology	SourceMedia, Inc.	01/07/1997	31/05/2009								
Core	Trade Publication	1044-5714	Accounting Today	SourceMedia, Inc.	01/07/2003									
Core	Academic Journal	2088-9860	Aceh International Journal of Science & Technology	PPs-Unsyiah	01/11/2012		01/11/2012			Y	Y			
Core	Academic Journal	1547-3716	ACET Journal of Computer Education & Research	Association for Computer Educators in Texas	01/01/2013		01/01/2013			Y				
Core	Academic Journal	0889-325X	ACI Materials Journal	American Concrete Institute	01/01/1987		01/01/2009			Y	Y	Y	01/01/2009	
Core	Academic Journal	0889-3241	ACI Structural Journal	American Concrete Institute	01/01/1987		01/01/2009			Y	Y	Y	01/01/2009	
Core	Academic Journal	0360-0300	ACM Computing Surveys	Association for Computing Machinery	01/01/1971		01/03/2004			Y	Y	Y	01/03/1971	
Core	Academic Journal	1550-4832	ACM Journal on Emerging Technologies in Computing Systems	Association for Computing Machinery	01/01/2009		01/01/2009			Y	Y	Y		
Core	Academic Journal	1542-7730	ACM Queue	Association for Computing Machinery	01/05/2007		01/05/2007			Y	Y	Y		
Core	Conference Proceedings Collection		ACM SIGACCESS Conference on Computers & Accessibility	Association for Computing Machinery	01/01/2008		01/01/2008					Y		
Core	Academic Journal	1549-6325	ACM Transactions on Algorithms	Association for Computing Machinery	01/01/2006		01/01/2006			Y	Y	Y		
Core	Academic Journal	1556-4665	ACM Transactions on Autonomous & Adaptive Systems	Association for Computing Machinery	01/06/2007		01/06/2007			Y	Y	Y		
Core	Academic Journal	1529-3785	ACM Transactions on Computational Logic	Association for Computing Machinery	01/07/2004		01/04/2006			Y	Y	Y		
Core	Academic Journal	0734-2071	ACM Transactions on Computer Systems	Association for Computing Machinery	01/02/1991		01/06/2008			Y	Y	Y	01/01/2003	
Core	Academic Journal	1073-0516	ACM Transactions on Computer-Human Interaction (TOCHI)	Association for Computing Machinery	01/03/2003		01/04/2009			Y	Y	Y	01/01/2009	
Core	Academic Journal	0362-5915	ACM Transactions on Database Systems	Association for Computing Machinery	01/03/1983		01/12/1996			Y	Y	Y	01/12/1996	
Core	Academic Journal	1539-9087	ACM Transactions on Embedded Computing Systems	Association for Computing Machinery	01/07/2007		01/07/2007			Y	Y	Y		
Core	Academic Journal	0730-0301	ACM Transactions on Graphics	Association for Computing Machinery	01/01/1991					Y				
Core	Academic Journal	1094-9224	ACM Transactions on Information & System Security (TISSEC)	Association for Computing Machinery	01/02/2003		01/01/2009			Y	Y	Y	01/01/2009	
Core	Academic Journal	1046-8188	ACM Transactions on Information Systems	Association for Computing Machinery	01/06/1996		01/01/2006			Y	Y	Y	01/01/2003	
Core	Academic Journal	1533-5399	ACM Transactions on Internet Technology	Association for Computing Machinery	01/02/2006		01/02/2006			Y	Y	Y		
Core	Academic Journal	1556-4681	ACM Transactions on Knowledge Discovery from Data	Association for Computing Machinery	01/03/2007		01/03/2007			Y	Y	Y		
Core	Academic Journal	0098-3500	ACM Transactions on Mathematical Software	Association for Computing Machinery	01/02/1977					Y			01/01/2003	
Core	Academic Journal	1049-3301	ACM Transactions on Modeling & Computer Simulation	Association for Computing Machinery	01/01/1997					Y				
Core	Academic Journal	1551-6857	ACM Transactions on Multimedia Computing, Communications & Applications	Association for Computing Machinery	01/02/2006		01/02/2006			Y	Y	Y		
Core	Academic Journal	0164-0925	ACM Transactions on Programming Languages & Systems	Association for Computing Machinery	01/01/1991		01/01/2009			Y	Y	Y	01/01/2003	

Coverage Policy	Source Type	ISSN / ISBN	Publication Name	Publisher	Indexing & Abstracting Start	Indexing & Abstracting Stop	Full Text Start	Full Text Stop	Full Text Delay (months)	Peer-Reviewed	PDF Images (full page)	Image Quick-View	Searchable References Start	Cited References Stop
Core	Academic Journal	1550-4859	ACM Transactions on Sensor Networks	Association for Computing Machinery	01/02/2009		01/02/2009			Y	Y	Y		
Core	Academic Journal	1049-331X	ACM Transactions on Software Engineering & Methodology	Association for Computing Machinery	01/01/1997		01/04/2006			Y	Y	Y		
Core	Academic Journal	1553-3077	ACM Transactions on Storage	Association for Computing Machinery	01/06/2007		01/06/2007			Y	Y	Y		
Core	Academic Journal	1559-1131	ACM Transactions on the Web	Association for Computing Machinery	01/05/2007		01/05/2007			Y	Y	Y		
Core	Conference Proceedings Collection		ACM/IEEE International Conference on Human-Robot Interaction	Association for Computing Machinery	01/01/2008		01/01/2008				Y	Y		
Core	Academic Journal	1335-8243	Acta Electrotechnica & Informatica	De Gruyter Open	01/08/2013		01/08/2013			Y				
Core	Academic Journal	0001-5903	Acta Informatica	Springer Science & Business Media B.V.	01/10/1996		01/10/1996		12	Y	Y	Y	01/01/2008	
Core	Academic Journal	0962-4929	Acta Numerica	Cambridge University Press	01/01/2007					Y				
Core	Academic Journal	1221-5848	Acta Technica Napocensis: Civil Engineering & Architecture	Universitatea Tehnica din Cluj-Napoca, Facultatea de Constructii	01/06/2013		01/06/2013			Y				
Core	Academic Journal	0882-7516	Active & Passive Electronic Components	Hindawi Publishing Corporation	01/03/2002		01/03/2002			Y	Y	Y	01/11/2002	
Core	Academic Journal	1570-8705	Ad Hoc Networks	Elsevier Science	01/01/2003					Y				
Core	Academic Journal	1059-7123	Adaptive Behavior	Sage Publications	01/07/1996					Y				
Core	Book / Monograph	9780471607915	Adaptive Blind Signal & Image Processing	John Wiley & Sons, Inc.	01/01/2002	31/01/2002	01/01/2002	31/01/2002			Y			
Core	Book / Monograph	9780471492870	Adaptive Filtering & Change Detection	John Wiley & Sons, Inc.	01/01/2000	02/01/2000	01/01/2000	02/01/2000			Y			
Core	Book / Monograph	9780470848258	Adaptive WCDMA	John Wiley & Sons, Inc.	01/01/2003	31/01/2003	01/01/2003	31/01/2003			Y			
Core	Book / Monograph	9780470846896	Adaptive Wireless Transceivers	John Wiley & Sons, Inc.	01/01/2002	31/01/2002	01/01/2002	31/01/2002			Y			
Core	Trade Publication	0001-821X	Adhesives Age	Chemical Week Associates	01/01/1967	31/08/2003								
Core	Academic Journal	1551-9899	Adhoc & Sensor Wireless Networks	Old City Publishing, Inc.	01/11/2006		01/11/2006			Y	Y	Y		
Core	Academic Journal	2146-586X	Adiyaman University Journal of Science & Technology / Adiyaman Universitesi Fen Bilimleri Dergisi	Adiyaman University, Institute of Science / Adiyaman Universitesi Fen Bilimleri Enstitüsü	01/06/2012		01/06/2012			Y	Y			
Priority	Academic Journal	0223-5439	Administration	Association du Corps Prefectoral et des Hauts Fonctionnaires du Ministère de l'Interieur	01/01/1921	01/06/1923				Y				
Priority	Magazine		Administrative Studies (University of Michigan)	Journal Collection (H.W. Wilson)	03/01/1940	03/01/1940								
Core	Book / Monograph	9780471290995	ADSL, VDSL, & Multicarrier Modulation	John Wiley & Sons, Inc.	01/01/2000	31/01/2000	01/01/2000	31/01/2000			Y			
Priority	Magazine		Adult Education & the Library	Journal Collection (H.W. Wilson)	01/09/1925	01/01/1930								
Core	Book / Monograph	9780471626923	Advanced Digital Signal Processing & Noise Reduction	John Wiley & Sons, Inc.	01/01/2000	02/01/2000	01/01/2000	02/01/2000			Y			
Core	Academic Journal	2234-991X	Advanced Engineering Forum	Trans Tech Publications, Ltd	01/01/2013		01/01/2013			Y	Y			
Core	Academic Journal	1474-0346	Advanced Engineering Informatics	Elsevier Science	01/01/2002					Y				
Core	Trade Publication	1042-0711	Advanced Imaging	Cygnus Business Media	01/04/2007	31/08/2010								
Priority	Academic Journal		Advanced Management	Society for Advancement of Management	02/01/1939	01/12/1957				Y				
Core	Academic Journal	0882-7958	Advanced Materials & Processes	ASM International	01/10/1986		01/07/1996			Y	Y			
Core	Academic Journal	1662-8985	Advanced Materials Research	Trans Tech Publications, Ltd	01/03/2014		01/03/2014			Y	Y			
Core	Trade Publication	1065-0555	Advanced Packaging	PennWell Corporation	01/04/2003	31/01/2009	01/04/2003	31/01/2009			Y			
Core	Academic Journal	1178-6949	Advances & Applications in Biology & Chemistry	Dove Medical Press Ltd	01/05/2012		01/05/2012			Y	Y			
Core	Academic Journal	1687-7470	Advances in Artificial Intelligence (16877470)	Hindawi Publishing Corporation	01/01/2008		01/01/2008			Y	Y	Y		
Core	Academic Journal	1687-7594	Advances in Artificial Neural Systems	Hindawi Publishing Corporation	01/01/2008		01/01/2008			Y	Y	Y		
Core	Academic Journal	1687-8027	Advances in Bioinformatics	Hindawi Publishing Corporation	01/01/2008		01/01/2008			Y	Y	Y		
Core	Academic Journal	2160-0589	Advances in Biomedical Engineering	Information Engineering Research Institute	01/02/2012		01/02/2012			Y				
Core	Academic Journal	1687-8086	Advances in Civil Engineering	Hindawi Publishing Corporation	01/01/2008		01/01/2008			Y	Y	Y		
Core	Academic Journal	1019-7168	Advances in Computational Mathematics	Springer Science & Business Media B.V.	01/01/2007		01/01/2008		12	Y	Y	Y	01/01/2008	
Core	Academic Journal	0973-6107	Advances in Computational Sciences & Technology	Research India Publications	01/06/2010		01/06/2010			Y	Y	Y		
Core	Academic Journal	1687-8108	Advances in Condensed Matter Physics	Hindawi Publishing Corporation	01/01/2008		01/01/2008			Y	Y	Y		
Core	Academic Journal	2090-3359	Advances in Decision Sciences	Hindawi Publishing Corporation	01/01/2010		01/01/2010			Y	Y	Y		
Core	Academic Journal	1336-1376	Advances in Electrical & Electronic Engineering	Advances in Electrical & Electronic Engineering	01/12/2011		01/12/2011			Y	Y			
Core	Academic Journal	0965-9978	Advances in Engineering Software	Elsevier Science	01/02/2002					Y				
Core	Academic Journal	1687-7101	Advances in Fuzzy Systems	Hindawi Publishing Corporation	01/01/2008		01/01/2008			Y	Y	Y		
Core	Academic Journal	1687-5893	Advances in Human-Computer Interaction	Hindawi Publishing Corporation	01/01/2007		01/01/2007			Y	Y	Y		
Core	Academic Journal	1975-3700	Advances in Information Sciences & Service Sciences	Advanced Institute of Convergence Information Technology	01/11/2011		01/11/2011			Y	Y			
Core	Academic Journal	2300-2565	Advances in Manufacturing Science & Technology	De Gruyter Open	01/08/2013		01/08/2013			Y	Y			
Core	Academic Journal	1730-2439	Advances in Materials Science	De Gruyter Open	01/08/2013		01/08/2013			Y	Y			
Core	Academic Journal	1687-8434	Advances in Materials Science & Engineering	Hindawi Publishing Corporation	01/01/2008		01/01/2008			Y	Y	Y		
Core	Academic Journal	2160-0643	Advances in Mathematical & Computational Methods	Information Engineering Research Institute	01/01/2013		01/01/2013			Y				
Core	Academic Journal	1687-9120	Advances in Mathematical Physics	Hindawi Publishing Corporation	01/01/2008		01/01/2008			Y	Y	Y		
Core	Academic Journal	1930-5346	Advances in Mathematics of Communications	American Institute of Mathematical Sciences	01/03/2012		01/03/2012			Y	Y			
Core	Academic Journal	2160-0619	Advances in Mechanical Engineering (2160-0619)	Information Engineering Research Institute	01/01/2013		01/01/2013			Y				
Core	Academic Journal	1687-8132	Advances in Mechanical Engineering (Hindawi Publishing Corporation)	Hindawi Publishing Corporation	01/01/2008	31/12/2014	01/01/2008	31/12/2014		Y	Y	Y		
Core	Academic Journal	1687-8132	Advances in Mechanical Engineering (Sage Publications Inc.)	Sage Publications	01/01/2015					Y				
Core	Academic Journal	1687-5680	Advances in Multimedia	Hindawi Publishing Corporation	01/01/2007		01/01/2007			Y	Y	Y	01/01/2007	
Core	Academic Journal	1687-7276	Advances in Nonlinear Optics	Hindawi Publishing Corporation	01/01/2008	31/01/2009	01/01/2008	31/01/2009		Y	Y	Y		
Core	Academic Journal	1687-9147	Advances in Operations Research	Hindawi Publishing Corporation	01/01/2008		01/01/2008			Y	Y	Y		
Core	Academic Journal	1687-6393	Advances in Optical Technologies	Hindawi Publishing Corporation	01/01/2008		01/01/2008			Y	Y	Y		
Core	Academic Journal	1687-563X	Advances in Optoelectronics	Hindawi Publishing Corporation	01/01/2008		01/01/2008			Y	Y	Y	01/01/2008	
Core	Academic Journal	2090-181X	Advances in Power Electronics	Hindawi Publishing Corporation	01/01/2009		01/01/2009			Y	Y	Y		

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Core	Magazine		Internet World UK	Penton Publishing	01/04/2004	30/04/2004	01/04/2004	30/04/2004			Y			
Core	Magazine	2156-843X	Internet@Schools	Information Today Inc.	01/01/2011		01/01/2011				Y			
Core	Magazine	1096-9969	InternetWeek	United Business Media	01/09/1997	08/01/2002								
Core	Magazine	1079-0373	Internetwork	Boucher Communications Inc.	01/07/1996	31/03/1997								
Core	Book / Monograph	9780471975144	Internetworking LANs & WANs	John Wiley & Sons, Inc.	01/01/1998	02/01/1998	01/01/1998	02/01/1998			Y			
Core	Magazine	1546-3087	Intranets	Information Today Inc.	01/01/2004									
Core	Book / Monograph	9788479088736	Introducción a la Programación Orientada a Objetos	Digitalia, Inc.	01/01/2006	31/01/2006	01/01/2006	31/01/2006			Y	Y		
Core	Book / Monograph	9788479086735	Introducción a la Programación, Algoritmos y C/C++	Digitalia, Inc.	01/01/2000	31/01/2000	01/01/2000	31/01/2000			Y	Y		
Core	Book / Monograph	9788479087630	Introducción a la Teoría de la Computabilidad	Digitalia, Inc.	01/01/2003	31/01/2003	01/01/2003	31/01/2003			Y	Y		
Core	Book / Monograph	9788479088101	Introducción a las Bases de Datos Access 2003	Digitalia, Inc.	01/01/2004	31/01/2004	01/01/2004	31/01/2004			Y	Y		
Core	Book / Monograph	9788479087661	Introducción a las Operaciones de Separación. Cálculo Por Etapas de Equilibrio	Digitalia, Inc.	01/01/2003	31/01/2003	01/01/2003	31/01/2003			Y	Y		
Core	Book / Monograph	9788479087128	Introducción a las Operaciones de Separación. Contacto Continuo	Digitalia, Inc.	01/01/2004	31/01/2004	01/01/2004	31/01/2004			Y	Y		
Core	Book / Monograph	9788479084356	Introducción a TCP/IP. Sistemas de Transporte de Datos	Digitalia, Inc.	01/01/1998	31/01/1998	01/01/1998	31/01/1998			Y	Y		
Core	Book / Monograph	9788479085759	Introducción a Word 2000	Digitalia, Inc.	01/01/2000	31/01/2000	01/01/2000	31/01/2000			Y	Y		
Core	Book / Monograph	9780471491873	Introduction to IP & ATM Design & Performance	John Wiley & Sons, Inc.	01/01/2000	02/01/2000	01/01/2000	02/01/2000			Y			
Core	Book / Monograph	9780471406341	Introduction to Optical Waveguide Analysis	John Wiley & Sons, Inc.	01/01/2001	02/01/2001	01/01/2001	02/01/2001			Y			
Core	Academic Journal	0266-5611	Inverse Problems	IOP Publishing	01/04/2003					Y				
Core	Academic Journal	1930-8337	Inverse Problems & Imaging	American Institute of Mathematical Sciences	01/03/2012		01/03/2012			Y	Y			
Priority	Report		Investigational Report. United States. Bureau of Fisheries	Book Collection (H.W. Wilson)	01/01/1931	01/01/1939								
Priority	Magazine		Investment Banking	Journal Collection (H.W. Wilson)	01/04/1931	01/01/1945								
Priority	Magazine		Iowa State College Bulletin	Journal Collection (H.W. Wilson)	01/01/1916	02/01/1941								
Priority	Magazine		Iowa State College. Engineering Experiment Station. Bulletin	Journal Collection (H.W. Wilson)	01/01/1924	01/01/1945								
Priority	Magazine		Iowa Studies in Business (University of Iowa. Bureau of Business & Economic Research)	Journal Collection (H.W. Wilson)	01/01/1930	02/01/1937								
Priority	Magazine		Iowa University Studies in Engineering Bulletin	Journal Collection (H.W. Wilson)	01/01/1926	01/01/1947								
Priority	Magazine		Iowa University Studies in Natural History	Journal Collection (H.W. Wilson)	01/01/1921	02/01/1940								
Priority	Magazine		Iowa University Studies in Social Sciences	Journal Collection (H.W. Wilson)	01/01/1927	02/01/1939								
Core	Book / Monograph	9780471486978	IP for 3G	John Wiley & Sons, Inc.	01/01/2002	02/01/2002	01/01/2002	02/01/2002			Y			
Core	Book / Monograph	9780470844175	IP Over WDM	John Wiley & Sons, Inc.	01/01/2002	31/01/2002	01/01/2002	31/01/2002			Y			
Core	Magazine	2167-5325	iPro Developer	Penton Publishing	01/05/2012		01/05/2012				Y			
Core	Book / Monograph	9781602670051	IPv6 Deployment Guide	Javvin Technologies, Inc.	01/09/2008	30/09/2008	01/09/2008	30/09/2008				Y		
Core	Conference Proceedings Collection	1891-9863	IRIS: Selected Papers of the Information Systems Research Seminar in Scandinavia	Akademika Publishing	01/08/2009		01/08/2009				Y			
Priority	Trade Publication	0021-1559	Iron & Steel Engineer	Association for Iron & Steel Technology	02/01/1948	01/11/1996								
Core	Magazine	0897-4365	Iron Age	Euromoney Institutional Investor PLC	03/10/1983	30/09/1993								
Priority	Magazine	0021-1508	Iron Age (New York, N.Y.)	Journal Collection (H.W. Wilson)	02/01/1913	06/12/1982								
Priority	Trade Publication	0747-6329	Iron Age Metals Producer	American Metal Market LLC	02/01/1984	01/11/1987								
Priority	Magazine		Iron Trade Review	Journal Collection (H.W. Wilson)	02/01/1913	26/06/1930								
Priority	Academic Journal	0301-9233	Ironmaking & Steelmaking	Maney Publishing	01/01/1974	07/01/1982				Y				
Priority	Magazine	0096-0810	Isa Journal.	Journal Collection (H.W. Wilson)	01/01/1958	01/12/1966								
Core	Academic Journal	0019-0578	ISA Transactions	Elsevier Science	04/01/1967					Y				
Core	Academic Journal	2042-5678	ISChannel	iSChannel	01/09/2011		01/09/2011			Y	Y			
Core	Book / Monograph	9780471979050	ISDN Explained	John Wiley & Sons, Inc.	01/01/1998	02/01/1998	01/01/1998	02/01/1998			Y			
Core	Academic Journal	2008-2045	ISecure	Iranian Society of Cryptology	01/01/2009		01/01/2009			Y	Y			
Core	Magazine	1536-755X	iSeries NEWS	Penton Publishing	01/04/2004	31/08/2006	01/04/2004	31/08/2006			Y			
Core	Magazine	1475-9128	iSeries NEWS UK	UBM Information Ltd.	01/02/2005	31/08/2006	01/02/2005	31/08/2006			Y			
Priority	Academic Journal	0021-1753	ISIS: Journal of the History of Science in Society	University of Chicago Press	01/03/1946	01/03/1946				Y				
Core	Academic Journal	2090-7443	ISRN Artificial Intelligence	Hindawi Publishing Corporation	01/01/2012		01/01/2012			Y	Y			
Core	Academic Journal	2090-7494	ISRN Ceramics	Hindawi Publishing Corporation	01/01/2012		01/01/2012			Y	Y			
Core	Academic Journal	2090-861X	ISRN Chemical Engineering	Hindawi Publishing Corporation	01/02/2013		01/02/2013			Y	Y			
Core	Academic Journal	2090-8636	ISRN Chromatography	Hindawi Publishing Corporation	01/02/2013		01/02/2013			Y	Y			
Core	Academic Journal	2090-4355	ISRN Communications & Networking	Hindawi Publishing Corporation	01/01/2011		01/01/2011			Y	Y			
Core	Academic Journal	2090-8903	ISRN Corrosion	Hindawi Publishing Corporation	01/01/2012		01/01/2012			Y	Y			
Core	Academic Journal	2090-8679	ISRN Electronics	Hindawi Publishing Corporation	01/02/2013		01/02/2013			Y	Y			
Core	Academic Journal	2090-8946	ISRN Geophysics	Hindawi Publishing Corporation	01/01/2012		01/01/2012			Y	Y			
Core	Academic Journal	2090-8717	ISRN Metallurgy	Hindawi Publishing Corporation	01/01/2012		01/01/2012			Y	Y			
Core	Academic Journal	2090-7907	ISRN Molecular Biology	Hindawi Publishing Corporation	01/01/2012		01/01/2012			Y	Y			
Core	Academic Journal	2090-6064	ISRN Nanotechnology	Hindawi Publishing Corporation	01/01/2011		01/01/2011			Y	Y			
Core	Academic Journal	2090-5041	ISRN Signal Processing	Hindawi Publishing Corporation	01/01/2011		01/01/2011			Y	Y			
Core	Academic Journal	2090-8776	ISRN Spectroscopy	Hindawi Publishing Corporation	01/01/2012		01/01/2012			Y	Y			
Core	Academic Journal	1547-5840	Issues in Informing Science & Information Technology	Informing Science	01/01/2004		01/01/2004			Y	Y	Y		
Core	Academic Journal	0748-5492	Issues in Science & Technology	University of Texas at Dallas	01/07/1990		01/09/1990			Y	Y	Y	01/07/2005	
Core	Trade Publication	1557-2145	IT Architect	United Business Media	01/09/2005	31/03/2006								
Core	Magazine	1520-9202	IT Professional	IEEE Computer Society	01/01/1999		01/09/2010				Y	Y		
Core	Magazine	1462-396X	IT Week	Incisive Financial Publishing	30/05/2005	31/08/2008	30/05/2005	31/08/2008						

Coverage Policy	Source Type	ISSN / ISBN	Publication Name	Publisher	Indexing & Abstracting Start	Indexing & Abstracting Stop	Full Text Start	Full Text Stop	Full Text Delay (months)	Peer-Reviewed	PDF Images (full page)	Image Quick-View	Searchable References Start	Cited References Stop
Core	Academic Journal	0162-8178	ITE Journal	Institute of Transportation Engineers	01/06/1978		01/09/1998	01/01/2012		Y	Y			
Core	Academic Journal	1746-5702	ITNOW	Oxford University Press	01/03/2005		01/03/2005		12	Y	Y			
Core	Academic Journal	0974-6544	IUP Journal of Computational Mathematics	IUP Publications	01/12/2009	31/03/2012	01/12/2009	31/03/2012		Y	Y	Y		
Core	Academic Journal	0973-9904	IUP Journal of Computer Sciences	IUP Publications	01/08/2009		01/08/2009			Y	Y	Y		
Core	Academic Journal	0973-2896	IUP Journal of Information Technology	IUP Publications	01/08/2009		01/08/2009			Y	Y	Y		
Core	Academic Journal	0974-6536	IUP Journal of Mechanical Engineering	IUP Publications	01/11/2009		01/11/2009			Y	Y	Y		
Core	Academic Journal	0973-2268	IUP Journal of Science & Technology	IUP Publications	01/08/2009	31/12/2011	01/08/2009	31/12/2011		Y	Y	Y		
Core	Academic Journal	0972-6896	IUP Journal of Systems Management	IUP Publications	01/08/2009	29/02/2012	01/08/2009	29/02/2012		Y	Y	Y		
Core	Magazine	1345-4846	J@pan Inc.	Japan Inc Communications, K.K.	01/11/1999	31/07/2009	01/11/1999	31/07/2009			Y			
Core	Academic Journal	1638-5705	J3eA	EDP Sciences	01/01/2011		01/01/2011			Y	Y			
Core	Magazine	0894-0630	JAPCA	Air & Waste Management Association	01/02/1985	01/12/1989								
Core	Academic Journal	1547-0083	JCT CoatingsTech	American Coatings Association	01/01/2004	01/11/2011	01/01/2004	01/11/2011		Y	Y			
Core	Academic Journal	1945-9645	JCT Research	Springer Science & Business Media B.V.	01/01/2004	01/09/2008	01/01/2004	01/09/2008		Y	Y	Y	01/01/2008	31/10/2008
Priority	Magazine	0095-8751	Jet Propulsion.	Journal Collection (H.W. Wilson)	01/01/1958	01/12/1958								
Priority	Academic Journal	0021-3667	JGE: The Journal of General Education	Pennsylvania State University Press	01/01/1973	01/07/1982				Y				
Priority	Magazine		JOM (1974)	Journal Collection (H.W. Wilson)	01/12/1974	01/10/1981								
Core	Academic Journal	1047-4838	JOM: The Journal of The Minerals, Metals & Materials Society (TMS)	Springer Science & Business Media B.V.	01/12/1975		01/01/2004		12	Y	Y	Y	01/01/2008	
Priority	Academic Journal	0099-1333	Journal of Academic Librarianship	Elsevier Science	01/07/1977	01/03/1983				Y				
Priority	Academic Journal	0021-8448	Journal of Accountancy	American Institute of Certified Public Accountants	01/01/1913	01/12/1957				Y				
Core	Academic Journal	1555-0281	Journal of Active & Passive Electronic Devices	Old City Publishing, Inc.	01/10/2007		01/10/2007			Y	Y	Y		
Core	Academic Journal	0021-8502	Journal of Aerosol Science	Pergamon Press - An Imprint of Elsevier Science	01/03/2002					Y				
Core	Academic Journal	0893-1321	Journal of Aerospace Engineering	American Society of Civil Engineers	01/01/1991		01/01/1995	30/03/2014		Y	Y	Y		
Priority	Academic Journal	0021-8561	Journal of Agricultural & Food Chemistry	American Chemical Society	01/01/1958	28/06/2006				Y				
Core	Academic Journal	0021-8669	Journal of Aircraft	American Institute of Aeronautics & Astronautics	01/01/1967					Y				
Core	Academic Journal	0196-6774	Journal of Algorithms	Academic Press	01/01/2002					Y				
Core	Academic Journal	1748-3018	Journal of Algorithms & Computational Technology	Mult-Science Publishing Co Ltd	01/11/2009		01/11/2009			Y	Y	Y	01/11/2009	
Core	Academic Journal	1876-1364	Journal of Ambient Intelligence & Smart Environments	IOS Press	01/08/2010		01/08/2010		12	Y	Y	Y		
Priority	Academic Journal	1060-3271	Journal of AOAC International	AOAC International	01/11/2008	01/11/2008				Y				
Priority	Academic Journal	0021-8863	Journal of Applied Behavioral Science	Sage Publications	01/09/1969	01/12/1982				Y				
Core	Academic Journal	1065-8483	Journal of Applied Biomechanics	Human Kinetics Publishers, Inc.	01/02/1993					Y			01/05/2006	
Priority	Academic Journal	0375-9210	Journal of Applied Chemistry & Biotechnology	John Wiley & Sons	01/01/1971	02/11/1976				Y				
Priority	Magazine	0021-8871	Journal of Applied Chemistry.	Journal Collection (H.W. Wilson)	01/01/1951	01/12/1970								
Core	Academic Journal	2066-4273	Journal of Applied Computer Science & Mathematic	Journal of Applied Computer Science & Mathematics	01/07/2010		01/07/2010			Y	Y	Y		
Core	Academic Journal	2230-4398	Journal of Applied Computing & Information Technology	Computing & Information Technology Research & Education New Zealand (CITREnz)	01/01/2011		01/01/2011			Y	Y		01/01/2011	
Core	Academic Journal	0021-891X	Journal of Applied Electrochemistry	Springer Science & Business Media B.V.	01/01/1983		01/01/1997		12	Y	Y	Y	01/01/2008	
Core	Academic Journal	2247-3769	Journal of Applied Engineering Sciences	University of Oradea, Faculty of Constructions & Architecture	01/01/2013		01/01/2013			Y	Y			
Core	Academic Journal	1735-3572	Journal of Applied Fluid Mechanics	Regional Information Center for Science & Technology	01/01/2008		01/01/2008			Y	Y	Y	01/01/2008	
Core	Academic Journal	1559-1948	Journal of Applied Functional Analysis	Eudoxus Press, LLC	01/01/2006		01/01/2006			Y	Y	Y		
Core	Academic Journal	2160-0953	Journal of Applied Learning Technology	Society for Applied Learning Technology	01/08/2011		01/08/2011			Y	Y			
Core	Academic Journal	1570-8683	Journal of Applied Logic	Elsevier Science	01/01/2003					Y				
Core	Academic Journal	0021-8936	Journal of Applied Mechanics	American Society of Mechanical Engineers	01/03/1958					Y				
Core	Academic Journal	0894-8763	Journal of Applied Meteorology	American Meteorological Society	01/02/1967	31/12/2005	01/07/1996	31/12/2005		Y	Y		01/07/1996	31/12/2005
Core	Academic Journal	1558-8424	Journal of Applied Meteorology & Climatology	American Meteorological Society	01/01/2006		01/01/2006			Y	Y	Y	01/01/2006	
Core	Academic Journal	1166-3081	Journal of Applied Non-Classical Logics	Taylor & Francis Ltd	01/06/2011					Y				
Core	Academic Journal	0021-8979	Journal of Applied Physics	American Institute of Physics	01/01/1940		01/01/1985		12	Y	Y	Y	01/01/2003	
Priority	Academic Journal	0021-9010	Journal of Applied Psychology	American Psychological Association	01/06/1929	01/12/1982				Y				
Core	Academic Journal	1939-8565	Journal of Applied Science & Engineering Technology	Rochester Institute of Technology	01/09/2011	31/12/2011	01/09/2011	31/12/2011		Y	Y	Y		
Core	Academic Journal	0855-2215	Journal of Applied Science & Technology	Journal of Applied Science & Technology (JAST)	01/01/2012					Y	Y			
Core	Academic Journal	1076-0431	Journal of Architectural Engineering	American Society of Civil Engineers	01/01/1995		01/01/1995	30/03/2014		Y	Y	Y	01/03/2008	
Core	Academic Journal	1076-9757	Journal of Artificial Intelligence Research	AAAI	01/01/2004					Y				
Core	Academic Journal	1737-9334	Journal of Artificial Intelligence: Theory & Application	HyperSciences Publisher	01/02/2010	31/07/2010	01/02/2010	31/07/2010		Y	Y	Y		
Core	Academic Journal	0739-0572	Journal of Atmospheric & Oceanic Technology	American Meteorological Society	01/01/1997		01/01/1997			Y	Y	Y	01/01/1997	
Core	Academic Journal	0168-7433	Journal of Automated Reasoning	Springer Science & Business Media B.V.	01/01/2007					Y				
Core	Academic Journal	1064-2315	Journal of Automation & Information Sciences	Begell House Incorporated	01/01/2002	30/09/2005				Y				
Priority	Academic Journal	0021-9258	Journal of Biological Chemistry	American Society for Biochemistry & Molecular Biology	18/03/2005	11/08/2006				Y				
Core	Academic Journal	0148-0731	Journal of Biomechanical Engineering	American Society of Mechanical Engineers	01/02/1983					Y				
Core	Academic Journal	1532-0464	Journal of Biomedical Informatics	Academic Press	01/01/2002					Y				
Priority	Academic Journal	0021-9304	Journal of Biomedical Materials Research	John Wiley & Sons, Inc.	01/01/2001	15/12/2007				Y				
Core	Academic Journal	1549-3296	Journal of Biomedical Materials Research, Part A	John Wiley & Sons, Inc.	01/06/2003	31/03/2004				Y				
Core	Academic Journal	1552-4973	Journal of Biomedical Materials Research, Part B: Applied Biomaterials	John Wiley & Sons, Inc.	15/04/2003	30/04/2004				Y				

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Core	Academic Journal	2251-7200	Journal of Biomedical Physics & Engineering	Shiraz University of Medical Sciences, School of Medicine, Department of Medical Physics	01/11/2012		01/11/2012			Y	Y			
Core	Academic Journal	1084-0702	Journal of Bridge Engineering	American Society of Civil Engineers	01/02/1996		01/02/1996	30/03/2014		Y	Y	Y		
Core	Academic Journal	0883-8151	Journal of Broadcasting & Electronic Media	Broadcast Education Association	01/01/1985		01/01/1985			Y	Y	Y	01/01/2003	
Core	Academic Journal	1940-1493	Journal of Building Performance Simulation	Taylor & Francis Ltd	01/02/2008					Y			01/02/2008	
Priority	Academic Journal	0021-9398	Journal of Business	University of Chicago Press	01/01/1928	01/10/1957				Y				
Priority	Academic Journal	0740-9168	Journal of Business of the University of Chicago	University of Chicago Press	01/07/1931	01/10/1947				Y				
Core	Academic Journal	0021-9517	Journal of Catalysis	Academic Press	01/01/1991					Y				
Priority	Academic Journal	0021-9533	Journal of Cell Science	Company of Biologists Ltd.	15/04/2006	15/04/2006				Y				
Core	Academic Journal	1879-9523	Journal of Chain-computerisation	Universiteit Utrecht	01/01/2011		01/01/2011			Y	Y			
Core	Academic Journal	0021-9568	Journal of Chemical & Engineering Data	American Chemical Society	01/01/1977					Y				
Priority	Academic Journal	0021-9584	Journal of Chemical Education	American Chemical Society	01/12/1929	01/11/1957				Y				
Core	Academic Journal	0095-2338	Journal of Chemical Information & Computer Sciences	American Chemical Society	01/04/2003	30/11/2004				Y				
Core	Academic Journal	1549-9596	Journal of Chemical Information & Modeling	American Chemical Society	01/01/2007					Y				
Priority	Academic Journal	0021-9606	Journal of Chemical Physics	American Institute of Physics	01/01/1941	04/10/1957				Y				
Core	Academic Journal	0268-2575	Journal of Chemical Technology & Biotechnology	John Wiley & Sons, Inc.	01/01/1991					Y				
Priority	Academic Journal	0021-9630	Journal of Child Psychology & Psychiatry & Allied Disciplines	Wiley-Blackwell	01/12/1968	01/04/1983				Y				
Core	Academic Journal	1671-8224	Journal of Chongqing University	Chongqing Daxue	01/03/2007					Y				
Core	Academic Journal	0218-1266	Journal of Circuits, Systems & Computers	World Scientific Publishing Company	01/02/1999		01/02/1999		12	Y	Y	Y		
Core	Academic Journal	0733-3021	Journal of Climate & Applied Meteorology	American Meteorological Society	01/01/1983	31/12/1987				Y				
Priority	Academic Journal	0021-9762	Journal of Clinical Psychology	John Wiley & Sons, Inc.	01/01/1949	01/04/1961				Y				
Core	Academic Journal	0749-0208	Journal of Coastal Research	Allen Press Publishing Services Inc.	01/03/1994		01/01/2001			Y	Y	Y	01/03/1994	
Core	Academic Journal	0361-8773	Journal of Coatings Technology	Springer Science & Business Media B.V.	01/01/1983	31/12/2003				Y				
Core	Academic Journal	1547-0091	Journal of Coatings Technology & Research	Springer Science & Business Media B.V.	01/03/2007		01/03/2007		12	Y	Y	Y	01/03/2007	
Priority	Academic Journal	1935-3804	Journal of Coatings Technology & Research.	Journal Collection (H.W. Wilson)	01/03/2007	01/07/2011	01/03/2007	01/11/2010		Y				
Core	Academic Journal	0898-929X	Journal of Cognitive Neuroscience	MIT Press	01/07/1996					Y			01/01/2003	
Core	Academic Journal	0887-381X	Journal of Cold Regions Engineering	American Society of Civil Engineers	01/03/1991		01/01/1995	30/03/2014		Y	Y	Y		
Priority	Academic Journal	0021-9797	Journal of Colloid & Interface Science	Academic Press	01/01/1966	01/11/1966				Y				
Priority	Academic Journal	0095-8522	Journal of Colloid Science	Academic Press	01/02/1958	01/12/1965				Y				
Core	Academic Journal	1382-6905	Journal of Combinatorial Optimization	Springer Science & Business Media B.V.	01/01/2007					Y				
Core	Academic Journal	0097-3165	Journal of Combinatorial Theory - Series A	Academic Press	01/01/2002					Y				
Priority	Magazine		Journal of Combustion Toxicology	Journal Collection (H.W. Wilson)	01/02/1977	01/05/1982				Y				
Priority	Academic Journal	0021-9916	Journal of Communication	Wiley-Blackwell	01/09/1961	01/12/1983				Y				
Core	Academic Journal	2093-9671	Journal of Communications & Information Sciences	Advanced Institute of Convergence Information Technology	01/11/2011		01/11/2011			Y	Y			
Core	Academic Journal	1845-6421	Journal of Communications Software & Systems	Croatian Communications & Information Society	01/03/2010		01/03/2010			Y	Y	Y		
Core	Academic Journal	1064-2269	Journal of Communications Technology & Electronics	Springer Science & Business Media B.V.	01/01/2011		01/01/2011		12	Y	Y			
Core	Academic Journal	2051-1310	Journal of Complex Networks	Oxford University Press	01/01/2013		01/01/2013		12	Y	Y			
Core	Academic Journal	0885-064X	Journal of Complexity	Academic Press	01/01/2002					Y				
Core	Academic Journal	0021-9983	Journal of Composite Materials	Sage Publications	01/01/1991					Y				
Core	Academic Journal	1090-0268	Journal of Composites for Construction	American Society of Civil Engineers	01/02/1997		01/02/1997	30/03/2014		Y	Y	Y	01/01/2003	
Core	Academic Journal	0377-0427	Journal of Computational & Applied Mathematics	Elsevier Science	01/01/2002					Y				
Core	Academic Journal	1586-2070	Journal of Computational & Applied Mechanics	Institute of Mathematics, University of Miskolc	01/01/2013		01/01/2013			Y	Y			
Core	Academic Journal	1061-8600	Journal of Computational & Graphical Statistics	Taylor & Francis Ltd	01/01/1994		01/09/2012		18	Y	Y		01/01/2003	
Core	Academic Journal	0218-396X	Journal of Computational Acoustics	World Scientific Publishing Company	01/03/1999		01/03/1999		12	Y	Y	Y		
Core	Academic Journal	1521-1398	Journal of Computational Analysis & Applications	Eudoxus Press, LLC	01/04/2003		01/01/2006			Y	Y	Y		
Core	Academic Journal	2158-2491	Journal of Computational Dynamics	American Institute of Mathematical Sciences	01/03/2012		01/03/2012			Y	Y			
Core	Academic Journal	0973-385X	Journal of Computational Intelligence in Bioinformatics	Research India Publications	01/01/2008		01/01/2008			Y	Y	Y		
Core	Academic Journal	0254-9409	Journal of Computational Mathematics	Global Science Press	01/03/1999		01/03/1999			Y	Y			
Core	Academic Journal	1472-7978	Journal of Computational Methods in Sciences & Engineering	IOS Press	01/01/2005		01/01/2005		12	Y	Y	Y		
Core	Academic Journal	0022-0000	Journal of Computer & System Sciences	Academic Press	01/01/2002					Y				
Core	Academic Journal	1064-2307	Journal of Computer & System Sciences International	Springer Science & Business Media B.V.	01/01/2012		01/01/2012		12	Y	Y			
Core	Academic Journal	0266-4909	Journal of Computer Assisted Learning	Wiley-Blackwell	01/03/1998		01/03/1998		12	Y	Y	Y	01/01/2003	
Core	Academic Journal	0887-4417	Journal of Computer Information Systems	International Association for Computer Information Systems	01/07/2000		01/07/2000			Y	Y		01/01/2003	
Core	Academic Journal	2090-7141	Journal of Computer Networks & Communications	Hindawi Publishing Corporation	01/01/2011		01/01/2011			Y	Y	Y		
Core	Academic Journal		Journal of Computer Resource Management	Computer Measurement Group	01/09/2002	31/01/2003				Y				
Core	Academic Journal	1844-6043	Journal of Computer Science & Control Systems	Journal of Computer Science & Control Systems	01/10/2009		01/10/2009			Y	Y	Y		
Core	Academic Journal	1000-9000	Journal of Computer Science & Technology (10009000)	Springer Science & Business Media B.V.	01/01/2007					Y				
Core	Academic Journal	1666-6046	Journal of Computer Science & Technology (JCS&T)	Journal of Computer Science & Technology	01/10/2008		01/10/2008			Y	Y	Y	01/10/2008	
Core	Academic Journal	0926-227X	Journal of Computer Security	IOS Press	01/03/1996		01/03/1996		9	Y	Y	Y	01/01/2003	
Core	Academic Journal	1687-7381	Journal of Computer Systems, Networks, & Communications	Hindawi Publishing Corporation	01/01/2008	31/12/2010	01/01/2008	31/12/2010		Y	Y	Y		
Core	Academic Journal	0928-1045	Journal of Computer-Aided Materials Design	Springer Science & Business Media B.V.	01/01/2004	31/12/2007				Y			01/01/2008	31/01/2008
Core	Academic Journal	0920-654X	Journal of Computer-Aided Molecular Design	Springer Science & Business Media B.V.	01/01/2003		01/01/2003		12	Y	Y	Y	01/01/2008	
Core	Academic Journal	0731-9258	Journal of Computers in Mathematics & Science Teaching	Association for the Advancement of Computing in Education	01/04/2003					Y			01/07/2005	
Core	Academic Journal	1530-9827	Journal of Computing & Information Science in Engineering	American Society of Mechanical Engineers	01/01/2007					Y				

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Priority	Magazine		<b>Wireless Age</b>	Journal Collection (H.W. Wilson)	02/01/1920	01/07/1925								
Core	Magazine	1681-1399	<b>Wireless Asia</b>	Questex Media Group	01/09/2001	31/01/2011	01/09/2001	31/01/2011			Y			
Core	Academic Journal	1530-8669	<b>Wireless Communications &amp; Mobile Computing</b>	John Wiley & Sons, Inc.	01/01/2001		01/01/2001		12	Y	Y	Y	01/01/2008	
Core	Book / Monograph	9780471316510	<b>Wireless Data Handbook</b>	John Wiley & Sons, Inc.	01/01/1999	02/01/1999	01/01/1999	02/01/1999			Y			
Core	Book / Monograph	9780470849491	<b>Wireless Data Technologies</b>	John Wiley & Sons, Inc.	01/01/2003	31/01/2003	01/01/2003	31/01/2003			Y			
Core	Trade Publication	1076-4240	<b>Wireless Design &amp; Development</b>	Advantage Business Media	01/08/1999		01/08/1999				Y	Y		
Priority	Magazine		<b>Wireless Engineer</b>	Journal Collection (H.W. Wilson)	01/01/1936	01/12/1956								
Priority	Magazine		<b>Wireless Engineer &amp; Experimental Wireless</b>	Journal Collection (H.W. Wilson)	01/09/1931	01/12/1935								
Core	Book / Monograph	9780471498469	<b>Wireless Local Loops</b>	John Wiley & Sons, Inc.	01/01/2001	31/01/2001	01/01/2001	31/01/2001			Y			
Core	Book / Monograph	9780470845295	<b>Wireless Networks</b>	John Wiley & Sons, Inc.	01/01/2003	31/01/2003	01/01/2003	31/01/2003			Y			
Core	Academic Journal	1022-0038	<b>Wireless Networks (10220038)</b>	Springer Science & Business Media B.V.	01/01/2001		01/01/2001		12	Y	Y	Y	01/01/2008	
Core	Academic Journal	0929-6212	<b>Wireless Personal Communications</b>	Springer Science & Business Media B.V.	01/01/2007		01/01/2008		12	Y	Y	Y	01/01/2008	
Core	Trade Publication	1099-9248	<b>Wireless Review</b>	Penton Media, Inc.	01/01/1998	30/11/2005	01/01/1998	30/11/2005			Y			
Core	Magazine	1089-5566	<b>Wireless Systems Design</b>	Penton Publishing	01/09/1999	31/03/2005								
Core	Trade Publication	1085-0473	<b>Wireless Week</b>	Advantage Business Media	09/08/1999		09/08/1999				Y	Y		
Priority	Magazine	0043-6062	<b>Wireless World.</b>	Journal Collection (H.W. Wilson)	01/01/1958	01/09/1983								
Priority	Magazine	0043-6526	<b>Wisconsin Library Bulletin</b>	Wisconsin Department of Public Instruction, Division for Libraries, Technology & Community Learning	01/02/1919	01/05/1924								
Core	Book / Monograph	9781602670082	<b>WLAN Quick Guide</b>	Javvin Technologies, Inc.	01/10/2007	31/10/2007	01/10/2007	31/10/2007			Y			
Core	Trade Publication	0043-7662	<b>Wood &amp; Wood Products</b>	Vance Publishing Corporation	01/01/1983	30/04/2013	01/01/1996	30/04/2013			Y			
Core	Academic Journal	1748-0272	<b>Wood Material Science &amp; Engineering</b>	Taylor & Francis Ltd	01/01/2006					Y			01/01/2008	
Core	Magazine	2327-7823	<b>Wood Products</b>	Vance Publishing Corporation	01/05/2013		01/05/2013				Y			
Priority	Academic Journal	0730-8884	<b>Work &amp; Occupations</b>	Sage Publications	01/08/2007	01/08/2007				Y				
Core	Trade Publication	1529-5052	<b>World Broadcast Engineering</b>	Penton Media, Inc.	01/02/2000	31/12/2001	01/02/2000	31/12/2001			Y			
Core	Trade Publication	1050-012X	<b>World Broadcast News</b>	Penton Media, Inc.	01/03/1999	31/01/2000	01/03/1999	31/01/2000						
Core	Academic Journal	2221-0741	<b>World of Computer Science &amp; Information Technology Journal</b>	Mauz Conti	01/07/2012		01/07/2012			Y	Y			
Core	Trade Publication	0043-8790	<b>World Oil</b>	Euromoney Institutional Investor PLC	01/12/1947		01/08/1993		0.9		Y		01/07/1973	
Core	Academic Journal	0172-2190	<b>World Patent Information</b>	Pergamon Press - An Imprint of Elsevier Science	01/01/2002					Y				
Priority	Trade Publication	1054-8637	<b>World Trade</b>	BNP Media	01/08/1939	01/08/1939								
Core	Trade Publication	1064-8429	<b>World Wastes</b>	Penton Media, Inc.	01/02/1992	28/02/1999	01/01/1997	28/02/1999			Y			
Core	Academic Journal	1386-145X	<b>World Wide Web</b>	Springer Science & Business Media B.V.	01/01/2007					Y				
Priority	Magazine		<b>Worlds Markets</b>	Journal Collection (H.W. Wilson)	02/08/1920	01/05/1924								
Core	Trade Publication		<b>Worldwide Databases</b>	Worldwide Vidcotex	01/07/1999		01/07/1999				Y			
Core	Academic Journal	1687-7632	<b>X-Rays Optics &amp; Instrumentation</b>	Hindawi Publishing Corporation	01/01/2008		01/01/2008			Y	Y	Y		
Core	Magazine	1088-0070	<b>Yahoo! Internet Life</b>	Ziff Davis, Inc.	01/12/2000	31/08/2002	01/12/2000	31/08/2002			Y			
Core	Academic Journal	0354-0243	<b>Yugoslav Journal of Operations Research</b>	Belgrade University, Faculty of Organizational Sciences	01/12/2012		01/12/2012			Y	Y			
Core	Academic Journal	0044-2267	<b>ZAMM – Journal of Applied Mathematics &amp; Mechanics / Zeitschrift für Angewandte Mathematik und Mechanik</b>	John Wiley & Sons, Inc.	01/01/1998		01/01/1998		12	Y	Y	Y	01/01/2008	
Priority	Magazine		<b>Zeitschrift für Angewandte Chemie</b>	Journal Collection (H.W. Wilson)	06/01/1927	30/04/1932								
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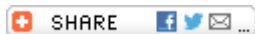
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## **EXPERIMENTS ON RHEOLOGY OF NON-NEWTONIAN FLOW OF TYLOSE-ALGINATE SUSPENSION THROUGH A HORIZONTAL COMPLEX CONDUIT**

B.F. Fagla, M.G. Gradeck † and M. Lebouche †

Laboratoire d'Energétique et de Mécanique Appliquée (LEMA), Ecole Polytechnique d'Abomey-Calavi/Université d'Abomey-Calavi 01 B.P. 2009 Cotonou (Bénin)

† Laboratoire d'Energétique et de Mécanique Théorique et Appliquée (LEMTA) CNRS/INPL/UHP1, Avenue de la forêt de Haye - BP 160 54504 Vandoeuvre-lès-Nancy cedex (France)

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### **ABSTRACT**

Experiments were conducted on rheological behavior of pseudoplastic non-Newtonian tylose-alginate (solid-liquid) suspensions in isothermal laminar flow in a horizontal conduit with variable geometry. The complex flow of loaded spherical and large-sized particles of 4.4 mm diameter, and dependence of hydrodynamics of organoleptic quality of the loaded fluids governed by Ostwald power law were investigated. The geometry of the horizontal pipe of variable cross-section provided turbulence promoters for fluid flow which generated back-flow zones for homogenizing the suspensions by improved mixing quality. The consistency index (K) increased with the volume fraction of solid particles, but decreased with temperature; and for a net change in viscosity of 0.75 % tylose concentrated solution, K increased with temperature of the carrier fluid. The structure index, n, varied with the concentration of the hard spheres, but did not vary substantially with temperature.

### **1. INTRODUCTION**

The food-processing industry has become a major economic sector in Benin, especially in developing innovative products for consumers, but not without raising new challenges for scientific research intervention on the production. The new food products, such as milky desserts, sauces, soups, cooked dishes, etc., often exhibit non-Newtonian and complex rheological properties, particularly, when the fluids are loaded with hard particles (e.g. yogurts with pieces of fruits) that modify the hydrodynamics of the mixture.

In the case of very viscous fluids loaded with particles, the processes for correct mixing by interactions with thrashing surfaces and plates exist, but the application to delicate solid-liquid suspensions has been difficult, because of denaturation by particles of small hydraulic diameter. Some technological solutions exist to prevent deterioration of the solid phase by adopting promoters of turbulence flow. The mechanisms of transportation of the particles in suspensions are also challenging and require experimental studies to resolve the problems.

The factors influencing transportation of loaded liquids are particle sizes, hydraulic diameter, concentrations, regime of suspension flow, rheological features of carrier fluids, and fluid-particle density ratio. Studies have shown that transport of solid particles in the fluid are influenced by hydrodynamic forces, visco-

us stresses and pressures exerted on the moving spheres [1].

For the transportation of low density ( $900 \text{ kg/m}^3$ ) polyethylene powder of particle diameter ranging from 70 - 1600  $\mu\text{m}$  in fluidized regime of velocity of 0.4 to 1.0 m/s, an empirical relation has been derived for the plug velocity as a function of the gas velocity, solid flux, riser diameter and particle size [2].

The power law model for pseudoplastic body lotions and Herschel-Bulkley model for viscoplastic creams have been analysed to obtain rheological parameters of viscoelastic, consistency parameter, yield stress, and other flow indices [3].

Rheological parameters of food suspensions have been compared to sensory texture attributes of removal from packages, ease of spreading, skin feel and thickness to establish relationships between rheological and sensory characteristics. For studies on non-Newtonian fluids with particles added, the rheological properties have been determined by developing and solving equations of two-dimensional steady state flow around solid circular particles exhibiting dilatation and creep [4].

The rheology of cornstarch suspensions, a non-Brownian system that exhibited discontinuous shear thickening, was studied by magnetic resonance imaging. The flow properties were obtained from the velocity profiles and concentrations in a Couette cell, and indicated that discontinuous shear thickening of co-

rnstarch suspensions was a consequence of dilatancy with a jamming transition, because of the confinement [5].

Experimental studies to determine the rheological properties of non-Newtonian flow of tylose-alginate suspensions with large-sized particles in a complex cylindrical conduit by pressure drop are presented in this paper.

## 2. EXPERIMENTAL WORK

### 2.1. Experimental Setup

The experimental setup shown in Fig.1 consisted of flow conduit, motor-pump, exchange graphite, upstream tank, downstream tank, electromagnetic flowmeter, pressure sensor, connecting PVC pipe of length 1.05 m and transparent PMMA tube of length 1.222 m. The centrifugal pump had semi-open wheel and helical rotor to prevent rapid damage to the hard phases, but allowed flow of very viscous products with debris at  $12 \text{ m}^3/\text{h}$  (at speed of 4.6 m/s). At the pump exit, the mixture extracted from the downstream tank was pentup in a graphite tubular intersection, at controlled temperature (of  $0.2 \text{ }^\circ\text{C}$  precision). In the upstream tray, throbings in the flow was absorbed, leading to homogenization of the solid-liquid mixture.

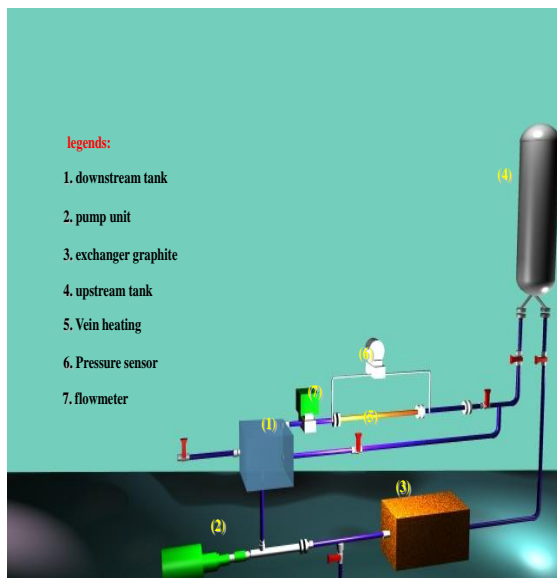


Fig. 1. Schematic diagram of experimental setup

A diversion conduit joined the exit of upstream tank to downstream tank and adapted flow of the mixture to the set experimental conditions. At the exit zone, an electromagnetic flow-meter measured the flow rate in real time. A differential pressure sensor measured the pr-

essure drop between entry and exit of the flow conduit.

Two pressure sensors placed at each end of the PPMA tube were used to measure the pressure on a length of 2.23 m. The tubes could be adapted for various measurement techniques, such as ultrasonic and laser velocimetry with Doppler effects. For tests under isothermal conditions, a copper tube of length 2.16 m with coiled thermocoax heating thread was used for electrical heating at maximum power of 4.13 kW, and 55 thermocouples were inserted to measure the temperatures along the tube.

### 2.2. Flow in Complex Conduit

The rheological behavior and pressure drop of the mixture in the complex conduit (Fig. 2) were measured by placing the PMMA tubet (30 mm interior diameter) in series with the PVC tube to establish the flow regime. The pressure drop over a length of 1.90 m was measured by pressure gauges installed at ends of the PMMA tube. The tube geometry promoted mixing of tylose solution and spherical particles at low Reynolds number, especially in the recirculation zone established downstream by the sudden enlargement (Fig. 3).

The length of the tube chosen for the recirculation was 12 m, which allowed laminar flow at generalized Reynolds number of 158 and for maximum heat transfer by the spheres. The diameter ratio  $D_1/D_2$  of 0.5 ensured effective mixing zone of the suspension at minimal risk of obstruction by the hard spheres (Fig. 3).

The diameter upstream of sudden enlargement did not generate excessive pressure drop, nor encouraged blocking of the pipe with high concentration of particles. In Fig. 2, the 30 mm diameter conduit was followed by a first sudden enlargement of 40 mm diameter. A convergent contracting the passage to 20 mm diameter preceded a second sudden enlargement with 40 mm diameter ( $D_1/D_2 = 0.5$ ), for the fluid flow through the mixing length of 120 mm before the second convergent which was the entry of the second module, to end in a convergent followed by a third sudden enlargement with 40 mm diameter.

### 2.3. Loaded Fluid (Suspension) Flow

The changes in geometry (Fig. 2), strongly disturbed the flow downstream, but were beneficial for heat and mass transfer. The

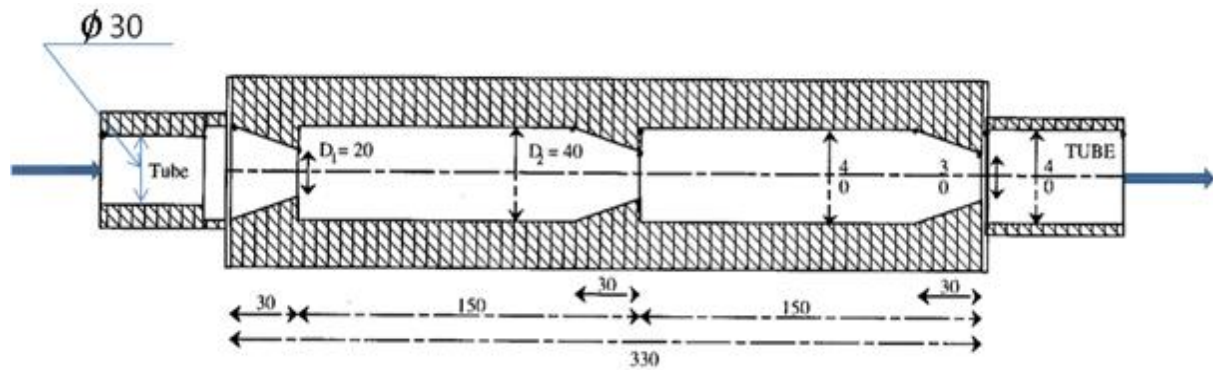


Fig. 2. Complex geometry of the test section

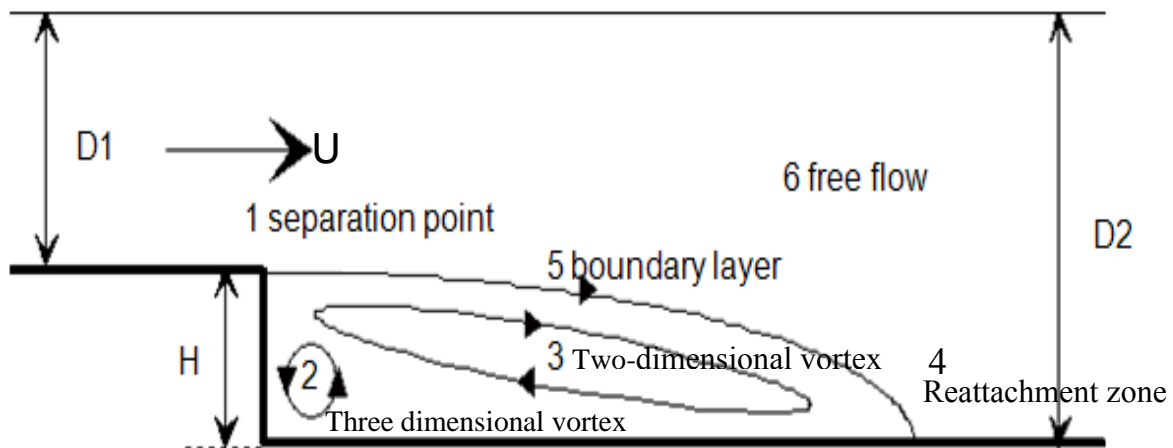


Fig. 3. Turbulent flow of water downstream of a step down

sudden enlargements of the flow system shown in Fig. 3 were based on analysis by Fagla [6], where Zone 1 was the separation point at angle of the flow where a shear layer occurred. In Zone 2, a three-dimensional vortex flow perpendicular to the free flow direction was developed. A recirculation was developed in Zone 3, consisting of two-dimensional vortex, with size depending on the Reynolds number, flow regime and characteristics of the fluid.

A gluing boundary layer (reattachment zone) occurred in Zone 4, where intensity of fluctuating velocity signal depended on generalized Reynolds number. In Zone 5, a three dimensional highly sheared and unsteady boundary area separated the free flow recirculation. In Zone 6, the free-flow downstream was characterized by conventional direct flow.

Sudden enlargement of flow conduit showed that the size of recirculation zone depended on the geometric characteristics, generalized Reynolds number and rheological properties of the fluid; and the configuration geome-

try ensured mixing of tylose-alginate suspension at low Reynolds number, especially in the recirculation zone established downstream [7].

#### 2.4. Preparation of Tylose Solution

Tylose ( $C_6H_{10}O_5$ )<sub>n</sub> solutions were prepared at concentrations of 0.40 % and 0.75 % in mass. For the 0.40 % concentration, 200 g tylose were mixed with 50 L of demineralized water, and stirred until homogenized. The process was repeated 3 times to obtain 150 L of the solution. Similarly, 150 L of 0.75 % tylose in mass were prepared using 1125 g. The tylose solution was then mixed with hard spherical particles of alginate, and the suspensions preserved by adding drops of sodium benzoate.

The specific heat ( $C_p$ ) and thermal conductivity ( $\lambda$ ) of tylose were taken as equivalent to the values for water at 20 °C,  $\lambda = 0.6$  W/(m K),  $C_p = 4.183$  kJ/(kg K) [8].

#### 2.5. Preparation of Alginate Spheres

The sodium alginate or polymannuro-

nate sodium alginate ( $\text{NaC}_6\text{H}_7\text{O}_6$ )<sub>n</sub> spheres were manufactured according to CERIA method [9]. A 3 % alginate solution (Protanal L F 10/60 or Protanal S F 120) or 600 g of Protanal mixed in 20 L of demineralized water was completely homogenized. Drops of the solution were put at the rate of 20 g/L into a tank containing solution of  $\text{CaCl}_2$ . The drop took the shape of a sphere during the free fall, and polymerized in contact with the saline solution. About 1 hour was required for complete polymerization of the spheres, but the mechanical holding was better with longer curing time in the solution. The average diameter of alginate spheres was 4.4 mm, and the ratio the dispersed phase in the conduit was  $> 0.13$ .

## 2.6. Loaded Tylose-Alginate Suspension

The 0.4 % tylose did not exhibit any non-Newtonian characteristics, since the structure index  $n \approx 1$  (instead of  $n < 1$ ). The experiments were therefore conducted using only the 0.75 % concentrated tylose solution. The longitudinal pressure gradients as function of generalized Reynolds number in single-phase and double-flow for three concentrations of hard spheres (i.e. 2.5 %, 5.0 % and 10.0 %; with 0 % as control) were analysed for correlations between the hard sphere concentration and the non-Newtonian viscosity of the mixture. The carrier fluid (0.75 % tylose) was sufficiently viscous for rheological measurements.

## 2.7. Rheology Measurements

The rheological properties of consistency index (K) and structural index (n) of tylose-alginate suspensions were measured using an imposed stress viscometer. The rheometer was programmed to give values of K and n as function of fluid temperature for 0.4 and 0.75 % tylose concentration. The fluid heated by a resistor was conducted through the rheometer.

For pseudoplastic behavior, the suspensions were modeled by the Ostwald Van der Waele law for shear strain rate of 0 - 500  $\text{s}^{-1}$ , in the form [9],

$$\tau_p = K\dot{\gamma}^n \quad (1)$$

where  $\tau_p$  is wall shear stress and  $\dot{\gamma}$  is shear strain rate at tube wall.

The indices K and n were also evaluated by Rabinowitsch-Mooney relation applied to pseudoplastic fluid represented by [9]

$$\frac{8Q_v}{\pi D^3} = \frac{n}{3n+1} \left( \frac{\tau_p}{K} \right)^{\frac{1}{n}} \quad (2)$$

$$\tau_p = K \frac{3n+1}{4n} \left( \frac{8\bar{U}}{D} \right)^n \quad (3)$$

where  $Q_v$  is volumetric flow rate, D is diameter of the measuring tube, and  $\bar{U}$  is mean velocity of spheres. The wall shear stress was calculated by the relation [9],

$$\tau_p = \frac{D_H}{4} \left( \frac{\Delta P}{L} \right) \quad (4)$$

where  $\Delta P$ ,  $D_H$  and L were respectively measured drop pressure, hydraulic diameter and length of the measuring tube.

## 3. RESULTS

### 3.1. Rheological Characteristics of the Suspension

Concentrated tylose exhibited temperature dependence as shown in Figs. 4 and 5, because of the high viscosity and heat release by viscous dissipation. The temperature dependency of K was clearly exhibited by 0.40 % and 0.75 % tylose concentrations, unlike the index n, as shown in Figs. 6 and 7. The two indices were parameterized by Arrhenius type laws,

$$K = A \exp(-aT) \quad (5)$$

$$n = B \exp(-bT) \quad (6)$$

The different plots of Fig. 8 show that the alginate hard spheres increased the longitudinal pressure gradient ( $\Delta P/L$ ), which was higher for 10 % concentration than suspensions at 5 and 2.5 % concentration. The single/mono phase suspension at 0 % hard spheres concentration exhibited the lowest  $\Delta P/L$  value. The effect of hard spheres on  $\Delta P/L$  originated from increased laminar flow regime.

### 3.2. Alginate Concentration on Suspension Flow

The change of flow regime from laminar to turbulent was evident only for alginate spheres concentration  $\Phi = 10\%$ , and the transition occurred at flow velocity  $\sim 1.08$  m/s; i.e. in Fig. 8, the  $\Phi = 10\%$  curve changed direction at velocity of  $\sim 1.08$  m/s. No turbulent regimes were observed for  $\Phi = 5\%$  and  $2.5\%$ , nor for single phase flow. The concentration of alginate hard spheres did not change the value of n, but K increased in proportion to the concentration (Fig. 9), which showed that the hard spheres influenced  $\Delta P/L$  in a laminar reg-

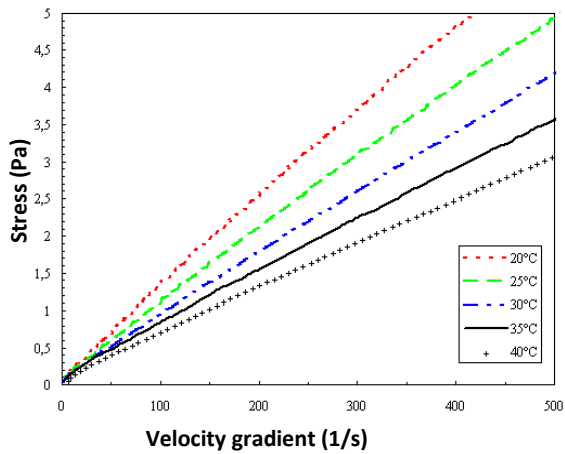


Fig. 4. Rheograms of 0.4 % tylose concentration at different temperatures.

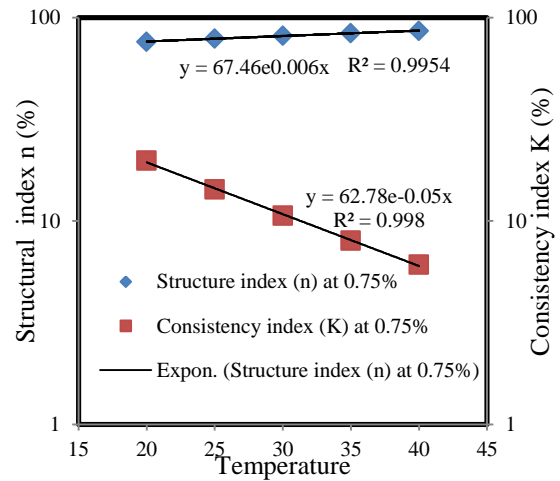


Fig.7. Variation of K and n with temperature for 0.75 % tylose concentration.

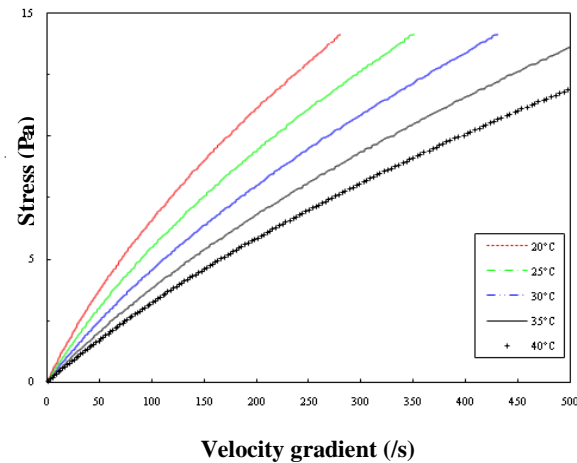


Fig. 5. Rheograms of 0.75 % tylose concentration at different temperatures.

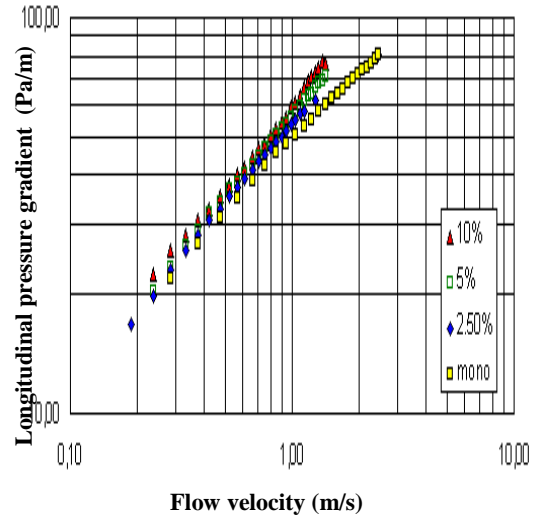


Fig. 8. Logarithmic plots of variation of longitudinal pressure gradient against flow velocity

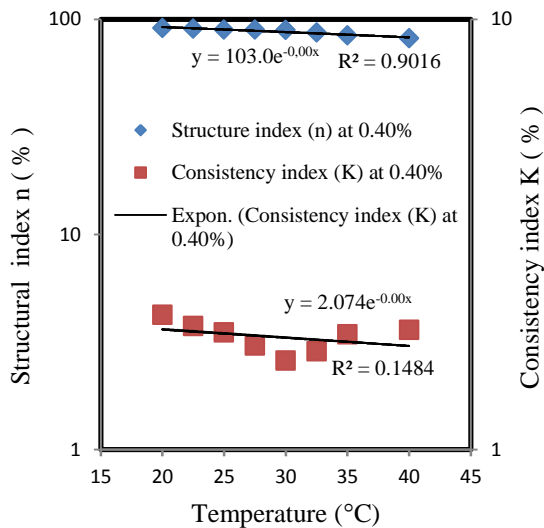


Fig. 6. Variation of consistency index (K) and structural index (n) with temperature for 0.40 % tylose concentration.

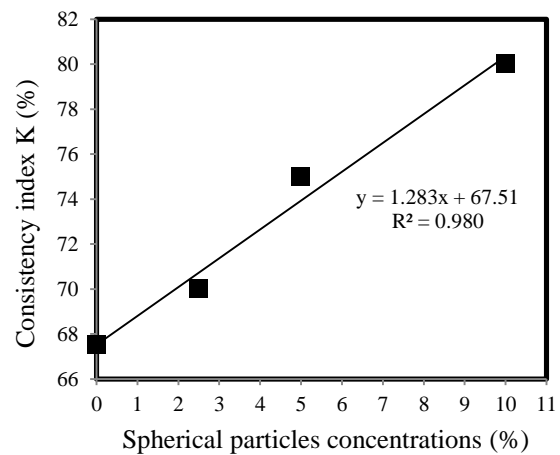


Fig. 9. Dependence of K on concentration  $\Phi$  of alignate hard spheres

ime. The alginate hard spheres increased  $\Delta P/L$  and consistency  $K$  of the mixtures in a linear relationship (Fig. 9), indicating improvement of the mixing using the complex geometry of the conduit, by promoting the emergence of a recirculation zone which improved the homogenization of the suspension by increasing collision between the particles.

### 3.3. Effect of tylose concentration on $K$ & $n$

For 0.40 % tylose concentration, the structure index  $n$  was constant and equal to 1 as evident from Fig. 6, indicating the Newtonian nature of the fluid, and effect of the wall shear stress  $\tau = K\dot{\gamma}^n$ .

For 0.75 tylose concentration,  $n$  ranged between 0 and 1 (Fig. 7), which corresponded to non-Newtonian fluid of flow governed by Ostwald van der Waele's power law for which the wall shear stress,  $\tau = K\dot{\gamma}^n$ .

Figure 10 shows the consistency dependence on the temperature for 0.40 and 0.75 % tylose concentrations. There was greater decrease of  $K$  with temperature for 0.75 % tylose ( $K = 20\%$  at  $20^\circ\text{C}$  to  $6\%$  at  $40^\circ\text{C}$  as compared with 0.40 % tylose, where  $K$  remained constant at  $2\%$  for the temperature range of  $20$  to  $40^\circ\text{C}$ .

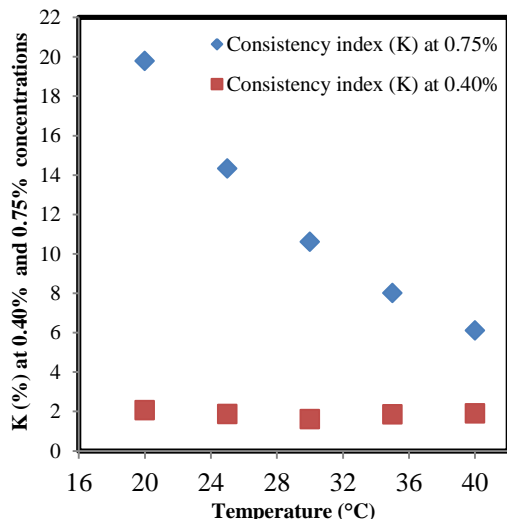


Fig. 10. Comparison of consistency indices at 0.40 % and 0.75 % tylose concentrations.

### 3.3. Single phase (Mono-phase) flow

The single-phase tylose concentrations of 0.4 and 0.75 % (i.e. without alginate spheres), were rheologically characterized using an imposed stress rheometer (CARRI-MED), ins-

stead of imposed shear rate. Comparison of Figs. 4 and 5 showed marked temperature dependency of the 0.75 % solution. For 0.4 % tylose, Fig. 6 showed that  $n$  did not vary substantially with temperature (almost constant), whereas  $K$  decreased with increasing temperature. For 0.75 % tylose, Fig. 7 showed that  $n$  increased marginally with temperature increase, but  $K$  decreased substantially with increasing temperature. Therefore, the temperature dependency of  $K$  of single phase tylose was more pronounced at higher concentration.

## 4. DISCUSSION

The experimental data confirmed observations that high concentration of single phase tylose increased consistency of the mixture [9]. Hence the analysis of the data was based on assumptions that the two-phase mixture (tylose-alginate) obeyed the power law of Ostwald Van der Waele.

The rheology of the carrier fluid and mixture integrated the conduit geometry, temperature dependence and other interactions, which improved mixing, and promoted emergence of recirculation zone for effective homogenization of the suspensions and increased collisions between the particles.

The hydraulic transport of solid particles was inhibited by pressure drop in the horizontal tube, which strongly affected the diphasic flow regime. Research on suspensions have characterized the pressure drop of diphasic mixture (rheofluidizing liquid and solid spheres) according to the concentration. The positive influence of the particles on transportation of loaded fluids has been demonstrated by the measured wall velocity gradient of suspension flow in a complex cylindrical conduit. The effect of pressure drop on rheological model of pseudoplastic suspensions were confirmed by the experiments.

## 5. CONCLUSIONS

The experiments had shown that alginate hard spheres increased the longitudinal pressure gradient in a laminar regime, while the consistency of the mixtures increased linearly with the concentration of the solid phase. The interactions between fluid-particle, particle-particle, and conduit geometry in relation with temperature dependence of the carrier fluid properties, led to flow of solid-liquid suspen-

sion in complex geometry for solid particles with aspect ratio  $d/D > 0.13$ . The interactions promoted effective mixing, while the emergence of a recirculation zone improved homogenization of the suspensions by increased collisions between the particles.

## 6. REFERENCES

1. Guyon E., Hulin J.P. and Petit L., *Hydrodynamique Physique*, Nouvelle édition, Revue et Augmentée, EDP Sciences, Paris, 2001.
2. Van Putten I.C., Van Sint Annaland M. and Weickert G., Fluidization behavior in a circulating slugging fluidized bed reactor, Part II: Plug characteristics, *Chemical Engineering Science*, Vol. 62, No. 9, 2007, pp. 2535 – 2544.
3. Moravkova T. and Stern P., Rheological and textural properties of cosmetic emulsions, *Appl. Rheol.*, Vol. 21, No. 3, 2011, pp. 35200 - 35206.
4. Chernov V. and Natan B., A simplified model for the evaluation of the rheological properties of a suspension of solids in a power-law fluid, *Appl. Rheol.*, Vol. 22, No. 1, 2012, pp. 15163 – 15173.
5. Fall A., Bonn D., Bertrand F. and Ovarlez G., Shear thickening of cornstarch suspensions, *J. Rheol.*, Vol. 56, No. 3, 2012, pp. 575 – 592.
6. Fagla F.Z.B., Etude thermique de suspensions solides-liquides non newtoniennes en conduite complexe horizontale, *Diplôme d'Etudes Approfondies (DEA)*, INPL Nancy, France, 1998
7. Ponthieux G., Ecoulement de fluides pseudo-plastiques à travers des élargissements brusques et des divergents, Modélisation des pertes d'énergie, *Thèse de Doctorat*, Nancy, 1991.
8. Lee W.Y., Cho Y.I. and Hartnett J.P., Thermal conductivity measurements of non-Newtonians fluids, *Letters in Heat and Mass Transfer*, Vol. 8, No. 4, 1981, pp. 255 - 259.
9. Hoareau F., Etude dynamique et thermique de suspensions solides-liquides non-newtoniennes en conduite, *Thèse Université de Nancy I*, 1996.