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Pakistan Journal of Scientific and Industrial Research
Series A: Physical Sciences
Vol. 61, No. 3, September-December, 2018

Contents

Special Paper

A Bibliometric Portrait of Pakistan Journal of Scientific and Industrial Research (PJSIR) During the Period of 1958-2007 Zameer Hussain Baladi	121
Studies of Chemical Constituents from <i>Eremostachys loasifolia</i> Muhammad Imran, Uzma Rasheed Mughal, Muhammad Iqbal, Riaz Hussain, Wasif Iqbal, Rafy Yaqeen and Sadia Ferheen	126
Assessment of Polycyclic Aromatic Hydrocarbons (PAHs) Present in the Atmosphere of Kot Lakhpat Industrial Estate of Lahore, Pakistan Imran Kalim, Naseem Zahra, Rubina Gilani and Liviu Mitu	132
Analysis of Water in the Area of District Sahiwal for Heavy Metals (A Case Study) Muhammad Zahir, Zahid Qureshi, Shahid Tufail, Khizar Hayat and Ahmad Hassan	138
Extraction of Gold from Boulangrite Ore by Ammonium Thiocyanate (NH₄SCN) Sajjad Ali, Sami Ullah, Muhammad Haris and Yaseen Iqbal	145
Hot Corrosion Study of High Velocity Oxy-Fuel (HVOF) Sprayed Coatings on Boiler Tube Steel in Actual Coal Fired Boiler Varinder Pal Singh Sidhu, Khushdeep Goyal and Rakesh Goyal	149
Land Use/Land Cover Changes Through Satellite Remote Sensing Approach: A Case Study of Indus Delta, Pakistan Zia ur Rehman and Syed Jamil Hasan Kazmi	156
Diagenetic History and Microfacies Analysis of Upper Permian Wargal Limestone in the Central Salt Range, Pakistan Salim Shehzad, Iftikhar Alam, Saqib Mehmood and Fazal Masood	163
 Review	
A Review on the Effect of Delamination on the Performance of Composite Plate Muhammad Imran, Rafiullah Khan and Saeed Badshah	173
Contents of Volume 61, Ser. A: Phys. Sci. (No. 1-3)	(i)
Author Index of Volume 61, Ser. A: Phys. Sci. (No. 1-3)	(iv)
Subject Index of Volume 61, Ser. A: Phys. Sci. (No. 1-3)	(vi)

Special Paper

A Bibliometric Portrait of Pakistan Journal of Scientific and Industrial Research (PJSIR) During the Period of 1958-2007

Zameer Hussain Baladi

King Saud Bin Abdulaziz University for Health Sciences, College of Applied Medical Sciences,
Ministry of National Guard Health Affairs Riyadh, Kingdom of Saudi Arabia

(received September 17, 2018; revised October 3, 2018; accepted October 5, 2018)

Abstract. Pakistan Journal of Science and Industrial Research (PJSIR) had celebrated its sixtieth anniversary in 2017. Inspired by this occasion, this observational study presents a bibliometric review on the quantity of all published materials under the caption of Physical, Biological and Technological Sciences with Short Communications during the period of 1958-2007 in Pakistan. The data of 340 issues of PJSIR was downloaded and collected to tabulate from the website of electronic journal: (<http://www.pjsir.org/arc.php>) during January-July, 2018. This study expressed that n=4929; 14.4% articles were published in 340 issues of PJSIR during the period of 1958-2007. Total 4417 (1790; 36.3%, 1651; 33.5%, and 976; 19.8%) articles published under the caption of Physical, Biological, and Technology out of 4929 articles. Remaining 512; 10.3% articles were short communications. Maximum articles n=1375; 28% were published in the fourth decade and n=694; 14% articles in the first decade as a minimum. The short communications n=208; 4.2% related to biological science take a position with the slight margin to other disciplines. PJSIR published regularly from 1958 to this day. It is counted a teamwork of the management of Journal and supported by Pakistan Council of Scientific and Industrial Research (PCSIR) Government-owned body. There are few examples in the world to publish a scientific journal which covers three major disciplines of science.

Keywords: bibliometrics, PJSIR, PCSIR, Ministry of Science and Technology, Pakistan

Studies of Chemical Constituents from *Eremostachys loasifolia*

Muhammad Imran^{ab*}, Uzma Rasheed Mughal^c, Muhammad Iqbal^d, Riaz Hussain^e,
Wasif Iqbal^f, Rafy Yaqeen^g and Sadia Ferheen^g

^aDepartment of Chemistry, Ghazi University Dera Ghazi Khan, Pakistan

^bSchool of Chemistry, University of Bristol, United Kingdom

^cDepartment of Chemistry, GC University Faisalabad, Layyah Campus, Pakistan

^dDepartment of Biochemistry & Biotechnology, The Islamia University of Bahawalpur, Bahawalpur, Pakistan

^eDepartment of Chemistry, University of Education Lahore, D. G. Khan Campus, Pakistan

^fScience of Dental Materials, Mohammad Bin Qasim Medical and Dental College, Port Qasim, Karachi, Pakistan

^gPCSIR Laboratories Complex, Karachi-75280, Pakistan

(received November 9, 2017; revised August 8, 2018; accepted August 15, 2018)

Abstract. The chemical constituent analysis on the whole plant *Eremostachys loasifolia* (Family: Lamiaceae) resulted 13 compounds of flavonoids class for the first time from this species namely Loasifolin (1), Eremoside A (2), Eremoside B (3), Kaempferol (3,4',5,7-tetrahydroxyflavone) (4), 5-Hydroxy-6,7,8,4'-tetramethoxyflavone (5), 5-Hydroxy-3',4',6,7,8-pentamethoxyflavone (6), Apigenin (4',5,7-trihydroxyflavone) (7), Luteolin (3',4',5,7-tetrahydroxyflavone) (8), Apigenin 7-O- β -D-glucopyranose (9) 4-Methyl Kaempferol (3,5,6-trihydroxy-4-methoxy flavone) (10) 5-Hydroxy-7,4-dimethoxy flavones (11), 6,7-Dimethoxy-4,5-hydroxyflavone (12), 3,5,7-Trihydroxy-3',4'-dimethoxyflavone (13). Further, all isolated compounds showed antioxidant activity. The structures of isolated compounds were determined using different spectroscopic techniques including NMR, UV/Vis., IR and MS.

Keywords: *Eremostachys loasifolia*, antioxidant activity, flavonoids

Assessment of Polycyclic Aromatic Hydrocarbons (PAHs) Present in the Atmosphere of Kot Lakhpat Industrial Estate of Lahore, Pakistan

Imran Kalim^{ab*}, Naseem Zahra^b, Rubina Gilani^a and Liviu Mitu^c

^aDepartment of Chemistry, University of Engineering and Technology, Lahore-54890, Pakistan

^bFood & Biotechnology Research Centre, PCSIR Laboratories Complex, Ferozpur Road,
Lahore-54600, Pakistan

^cDepartment of Natural Science, University of Pitesti, Pitesti, Romania

(received July 04, 2017; revised May 21, 2018; accepted June 07, 2018)

Abstract. The current research was conducted for the determination of concentrations of health hazardous PAHs (polycyclic aromatic hydrocarbons) in atmosphere which are among the dangerous identified organic pollutants. The atmospheric particulate matters were collected using high volume samplers from the industrial estate of Kot Lakhpat, Lahore, Pakistan. Average TPM (mg) of PM_{2.5} was 16.030 and PM₁₀ was 144.300. The concentration of PM_{2.5} was 534.390 ng/m³/h and 12825 ng/m³/day, while concentration of PM₁₀ was 4180 ng/m³/h and 115440 ng/m³/day. Gas chromatography was used for the quantification of 16 different PAHs. The mean total quantity of PAHs in air was 742.030 ng/m³ on the basis of total particulate matter. The mean concentration of dibenzo(a,h) anthracene was highest i.e. 123.370 ng/m³ with 10.660 ng/m³ minimum and 236.080 ng/m³ maximum, concentrations. In the present study the PAHs concentrations are found to be very high, so, there should be proper air management system to control such health hazardous organic pollutants.

Keywords: organic pollutant, polycyclic aromatic hydrocarbon, gas chromatography, suspended particulate matter

Analysis of Water in the Area of District Sahiwal for Heavy Metals (A Case Study)

Muhammad Zahir^a, Zahid Qureshi^b, Shahid Tufail^a, Khizar Hayat^{*cd} and Ahmad Hassan^a

^aDepartment of Chemistry, Minhaj University Lahore, Punjab, Pakistan

^bDepartment of Chemistry, Government College University Lahore, Punjab, Pakistan

^cDepartment of Chemistry, Quaid-i-Azam University, Islamabad, Pakistan

^dDepartment of Chemistry, Government P/G College of Science, Faisalabad, Punjab, Pakistan

(received January 26, 2018; revised July 10, 2018; accepted July 11, 2018)

Abstract. Current study was conducted to analyze the water in the area of Sahiwal district for toxic metals. This study gives information about the concentrations of three toxic metals, arsenic (As), lead (Pb) and chromium Cr(III). Total of 20 samples were collected, including tap, filter plant, hand pump and tubewell water. The levels of As(III) and Cr(VI) were determined using spectrophotometer while As_{total}, Cr_{total} and Pb concentrations were analysed by using inductively coupled plasma-mass spectrometry (ICP-MS). The results of chromium were above EPA recommended value (0.05 ppm) in all the samples. On the other hand, the concentrations of arsenic and lead were lower than Pak-EPA Standard limits. The mean level of chromium was 5.559 mg/L which was 111.18 times higher than WHO and local standard of 0.05 mg/L. Similarly, the mean level of arsenic and lead were 10.668 µg/L and 7.037 µg/L, respectively, which were 4.687 and 7.1053 times, respectively lower than Pak-EPA Standard value of 50 µg/L.

Keywords: Sahiwal area, arsenic, chromium, lead, ICP-MS, spectrophotometer

Extraction of Gold From Boulangerite Ore by Ammonium Thiocyanate (NH_4SCN)

Sajad Ali*, Sami Ullah, Muhammad Haris and Yaseen Iqbal

Materials Research Laboratory, Department of Physics, University of Peshawar, Peshawar-25120, Pakistan

(received January 1, 2018; revised April 9, 2018; accepted May 22, 2018)

Abstract. In this study extraction of gold from Boulangerite ore ($\text{Pb}_5\text{Sb}_4\text{S}_{11}$) via hydrometallurgical leaching process was studied. Boulangerite ore sample was collected from Shishy Valley, Chitral, Khyber Pakhtunkhwa, Pakistan. The Influence of various parameters on the extraction of gold from boulangerite ore was investigated i.e., the amount of ammonium thiocyanate, leaching time, particle size of ore and temperature. Ore with particle size in the range 100-300 mesh gave satisfactory yield values. An increase in amount of ammonium thiocyanate and boulangerite ore, leaching time and particle size resulted in an increase in the amount of leached gold. At optimal conditions the extraction of gold was observed to increase from 32% to 80.69%.

Keywords: boulangerite ore, gold leaching, ammonium thiocyanate

Hot Corrosion Study of High Velocity Oxy-Fuel (HVOF) Sprayed Coatings on Boiler Tube Steel in Actual Coal Fired Boiler

Varinder Pal Singh Sidhu^a, Khushdeep Goyal^{a*} and Rakesh Goyal^b

^aDepartment of Mechanical Engineering, Punjabi University, Patiala, India

^bChitkara University, Rajpura, India

(received February 10, 2017; revised May 23, 2018; accepted May 31, 2018)

Abstract. The present study was focused on the effect of high velocity oxy-fuel (HVOF) sprayed 93(WC-Cr₃C₂)-7Ni and 86WC-10CO-4C coatings on boiler steel alloys ASME SA213 T22 and ASME SA213 T91 in coal fired boiler environment. To assess the performance of the coatings in actual conditions the coated as well as the uncoated steels were subjected to cyclic exposures, in the superheater zone of a coal fired boiler for 10 cycles at 900 °C. Both the coatings used were observed to be uniform and dense having thickness between 200-250 μm. Each cycle consists of 100 h heating followed by 1 h cooling at ambient conditions. The thermogravimetric technique was used to establish the kinetics of corrosion. X-ray diffraction (XRD), Scanning Electron Microscopy/Energy Dispersive Spectroscopy (SEM/EDS) techniques were used to analyse corrosion products. The hot corrosion resistance of 86WC-10CO-4C coating was found better on ASME SA213 T22 whereas 93(WC-Cr₃C₂)-7Ni coating was better on ASME SA213 T22.

Keywords: corrosion, boiler steel, degradation, HVOF, coal fired boilers

Land Use/Land Cover Changes Through Satellite Remote Sensing Approach: A Case Study of Indus Delta, Pakistan

Zia ur Rehman^{a*} and Syed Jamil Hasan Kazmi^b

^aPower Development Sindh Energy Department, Government of Sindh, Karachi, Pakistan

^bDepartment of Geography, University of Karachi-75270, Pakistan

(received March 23, 2018; revised July 16, 2018; accepted August 23, 2018)

Abstract. The Indus deltas with its coastal zones are the most important coastal environment for mangrove and related habitats in Pakistan. The aim of the study is to identify the land use/land cover (LULC) classes of the Indus Delta during 2000 and 2014 through satellite remote sensing (SRS), to evaluate the LULC changes of Indus Delta during this period and to investigate the LULC classes from ground truths. Satellite remote sensing is a modern technique for detection and mapping of LULC patterns and their changes without going into survey. Satellite images of Landsat-7 ETM+, March 8, 2000 and Landsat-8 OLI/TIRS, April 8, 2014 were used. A supervised classification technique was used to classify ten LULC classes. Results indicate that normal mangrove, cultivated land, dry mudflat, dry barren / vacant land and turbid water increased with 324.93 km² (23.21 km²/year), 749.44 km² (53.53km²/year), 171.01 km² (12.21 km²/year), 375.31 km² (26.81 km²/year) and 59 km² (4.21 km²/year), respectively, during the period of 2000-2014 due to plantation of mangroves in various creek areas in Indus Delta by Sindh Forest and Wildlife Department, SCCP, IUCN, WWF, etc. in the year of 2009 to 2013. Cultivated land is increased after the flood of 2010 and 2013 in the northern part of Indus Delta, while dense mangrove, other vegetation, wet mudflat, wet barren/ vacant land and deep water decreased with 12.99 km² (0.93 km²/year), 280.58 km² (20.04 km²/year), 290.54 km² (20.75 km²/year), 844.59 km² (60.33 km²/year) and 237.16 km² (16.94 km²/year), respectively, during 2000-2014. Some areas of other vegetation lands are converted to cultivated lands during 2000 to 2014. Similarly, some wet mudflat and wet barren / vacant land are converted to normal mangrove in the southern part of Indus Delta. Many factors affect the LULC of Indus Delta like sea water intrusion, insufficient freshwater below Kotri barrage, and at least one annual cyclone destructive to Sindh coast.

Keywords: GIS, SRS, environment, mangrove, ecology, Indus Delta.

Diagenetic History and Microfacies Analysis of Upper Permian Wargal Limestone in the Central Salt Range, Pakistan

Salim Shehzad^{**}, Iftikhar Alam^b, Saqib Mehmood^a and Fazal Masood^a

^aDepartment of Earth & Environmental Sciences, Bahria University, Sector E-8, Islamabad, Pakistan

^bPakistan Atomic Energy Commission, DEUP-II, Kohat, Pakistan

(received April 3, 2017; revised April 27, 2018; accepted May 18, 2018)

Abstract. The present study focuses on the microfacies analysis of Wargal Limestone in Central Salt Range. The Wargal Limestone is composed of thin to medium bedded, light to medium grey, olive grey and brownish grey limestone, dolomite with some marl and chert nodule. Field sampling was carried out on a 49m thick stratigraphic section and 25 samples of limestone were obtained for microfacies analysis. Based on skeletal grains, texture and diagenetic characteristics, seven microfacies namely: brachiopod, crinoidal grainstone (MF1), crinoidal, bryozoan grainstone (MF2), crinoidal sandy limestone (MF3), codiacean, crinoid, brachiopodal grainstone (MF4), codiacean, crinoidal grainstone (MF5), brachiopod, bryozoan, crinoidal grainstone (MF6) and crinoid, brachiopodal grainstone (MF7) have been recognized in the Wargal Limestone. A number of diagenetic features such as stylolite, dolomitization and cements types of equant blocky, syntaxial overgrowth and cavity fill spar were observed in the microfacies. The diagenetic processes have obliterated the grains morphology and rock fabric in some microfacies. The presence of stylolite and recrystallization of grains indicate mechanical compaction during the diagenesis. The microfacies and diagenetic features suggest deposition in warm shallow water conditions on carbonate ramp environment.

Keywords: microfacies analysis, diagenetic processes, Central Salt Range, Wargal Limestone

Review

A Review on the Effect of Delamination on the Performance of Composite Plate

Muhammad Imran*, Rafiullah Khan and Saeed Badshah

Department of Mechanical Engineering, International Islamic University, Islamabad, Pakistan

(received April 8, 2018; revised May 17, 2018; accepted May 22, 2018)

Abstract. Composite materials are the utmost widely used materials and terms of their strength to weight ratios make them most attractive materials for aerospace applications and other high load bearing structures where strength to weight ratio is critical. In the preliminary designs of aircraft components, laminated composites subjected to compressive loadings play a vital role and their performance is one of the most important parameters. This paper presents a comprehensive review on the performance of composite structures subjected to buckling loads and other behaviours. This review also lightens some of the attempts to understand the buckling behaviour of composite plates by numerical and experimental methods.

Keywords: buckling analysis, composite plate, delamination

Pakistan Journal of Scientific and Industrial Research
Series A: Physical Sciences
Volume 61

Contents

Series A: Physical Sciences
Vol. 61, No.1, January - April, 2018

Synthesis, Characterisation and Biological Activity of Schiff Base and its Cu(II), Pd(II), Pt(II) Complexes Derived from Tyrosine and Aromatic Aldehyde Rukhsana Anjum, Bushra Khan and Muhammad Javed	1
Thermodynamics and Kinetics of Reduction of Fe(III) Acetohydroxamic Acid Complex by Ascorbic Acid Muhammad Pervaiz, Shazia Nisar, Syed Arif Kazmi and Saima Imad	8
Antibacterial Potential Assessment of Schiff Bases Derived from 1-Aminoanthracene-9, 10-Dione Ghulam Fareed, Fouzia Khan, Nazia Fareed and Shahana Urooj Kazmi	15
Structural, Electrical and Thermal Properties of Lead Borate Glass Doped by V₂O₅ Content Rahma Hamed Marhoom, Mohamed Said Dawelbeit, Essam Elsayed Assem and Adel Ashour Mohamed	19
Influence of Chemical Surface Modifications on Mechanical Properties of <i>Combretum dolichopetalum</i> Fibre - High Density Polyethylene (HDPE) Composites Azeez Taofik Oladimeji, Onukwuli Okechukwu Dominic, Walter Peter Echeng and Menkiti Mathew Chukwudi	28
Enhanced Storage Capacity and Quality of Haleji and Hadero Lakes Connecting with Indus River for their Sustainable Revival Zia uddin Abro, Abdul Latif Qureshi, Shafi Muhammad Kori and Ali Asghar Mahessar	35
Monthly Monitoring of Physicochemical and Radiation Properties of Kufa River, Iraq Sadiq Kadhun Lafta Alzurfi, Ali Abid Abojassim and Hussien Abid Ali Mraity	43
Evaluation of Metals and Organic Contents in Locally Available Eye Shadow Products in Lahore, Pakistan Amina Abrar, Sofia Nosheen, Faiza Perveen and Moneeza Abbas	51
 Short Communication	
Cleaning of Dalwal-Punjab Coal by Using Shaking Table Muhammad Shahzad and Zulfiqar Ali	56

Vol. 61, No.2, May - August, 2018

Green Synthesis and Structural Characterisation of CuO Nanoparticles Prepared by Using Fig Leaves Extract Karim Henikish Hassan, Areej Ali Jarullah, Sally Kamil Saadi and Peter Harris	59
Synthesis, Characterisation and Antimicrobial Evaluation of Some New Heterocyclic Compounds Using Citric Acid as a Synthone Moayed Salim Al-Gwady, Salim Jasim Mohammed and Attalla Mohammed Sheat	66
Uric Acid Biosensor Using Immobilised <i>Lactobacillus plantarum</i> Mar8 on Zeolite/κ-Carrageenan Membrane Wahyuning Lestari, Dyah Iswantini, Novik Nurhidayat and Zaenal Abidin	74
Preparation of Rechargeable Battery from Poultry Waste Abrar Ul Hassan, Ayesha Mohyuddin and Sakhawat Ali	80
Vibration Analysis of Cracked Composite Laminated Plate Muhammad Imran, Rafiullah Khan and Saeed Badshah	84
GIS and RS Based Approach for Monitoring the Snow Cover Change in Gilgit Baltistan Umair Bin Zamir and Hina Masood	91
Characterisation of Patala Formation Coal Reserves of Salt Range and its Application Hafiz Muhammad Zulfiqar Ali, Aun Zahoor, Hafiz Muhammad Zaheer Afzal and Muhammad Yasin	96
Effect of Dyeing Temperature on the Shrinkage and Fastness Properties of Polyester/Acrylic Fabric Musaddaq Azeem, Ahmed Fraz and Asif Javed	100
A Study of Ambient Air Quality Status in Karachi by Applying Air Quality Index (AQI) Durdana Rais Hashmi, Akhtar Shareef and Razia Begum	106

Review

Economic Analysis of the Production of Electricity Generation and Fuel Oil from Different Renewable Resources in Pakistan Atif Khan, Hassan Javed Naqvi, Shabana Afzal, Zohaib Ashraf and Sana Zahid	115
--	-----

Vol. 61, No.3, September - December, 2018

Special Paper

A Bibliometric Portrait of Pakistan Journal of Scientific and Industrial Research (PJSIR) During the Period of 1958-2007 Zameer Hussain Baladi	121
--	-----

Studies of Chemical Constituents from <i>Eremostachys loasifolia</i> Muhammad Imran, Uzma Rasheed Mughal, Muhammad Iqbal, Riaz Hussain, Wasif Iqbal, Rafy Yaqeen and Sadia Ferheen	126
Assessment of Polycyclic Aromatic Hydrocarbons (PAHs) Present in the Atmosphere of Kot Lkhpat Industrial Estate of Lahore, Pakistan Imran Kalim, Naseem Zahra, Rubina Gilani and Liviu Mitu	132
Analysis of Water in the Area of District Sahiwal for Heavy Metals (A Case Study) Muhammad Zahir, Zahid Qureshi, Shahid Tufail, Khizar Hayat and Ahmad Hassan	138
Extraction of Gold from Boulangrite Ore by Ammonium Thiocyanate (NH₄SCN) Sajjad Ali, Sami Ullah, Muhammad Haris and Yaseen Iqbal	145
Hot Corrosion Study of High Velocity Oxy-Fuel (HVOF) Sprayed Coatings on Boiler Tube Steel in Actual Coal Fired Boiler Varinder Pal Singh Sidhu, Khushdeep Goyal and Rakesh Goyal	149
Land Use/Land Cover Changes Through Satellite Remote Sensing Approach: A Case Study of Indus Delta, Pakistan Zia ur Rehman and Syed Jamil Hasan Kazmi	156
Diagenetic History and Microfacies Analysis of Upper Permian Wargal Limestone in the Central Salt Range, Pakistan Salim Shehzad, Iftikhar Alam, Saqib Mehmood and Fazal Masood	163
 Review	
A Review on the Effect of Delamination on the Performance of Composite Plate Muhammad Imran, Rafiullah Khan and Saeed Badshah	173
 Contents of Volume 61, Ser. A: Phys. Sci. (No. 1-3)	 (i)
Author Index of Volume 61, Ser. A: Phys. Sci.	(iv)
Subject Index of Volume 61, Ser. A: Phys. Sci.	(vi)

Pakistan Journal of Scientific and Industrial Research
Series A: Physical Sciences
Volume 61

Author Index

- Abbas, Moneeza **61A(1)51**
Abidin, Zaenal **61A(2)74**
Abojassim, Ali Abid **61A(1)43**
Abrar, Amina **61A(1)51**
Abro, Zia uddin **61A(1)35**
Afzal, Hafiz Muhammad Zaheer **61A(2)96**
Afzal, Shabana **61A(2)115**
Alam, Iftikhar **61A(3)163**
Al-Gwady, Moayed Salim **61A(2)66**
Ali, Hafiz Muhammad Zulfiqar **61A(2)96**
Ali, Sajjad **61A(3)145**
Ali, Sakhawat **61A(2)80**
Ali, Zulfiqar **61A(1)56**
Alzurfi, Sadiq Kadhum Lafta **61A(1)43**
Anjum, Rukhsana **61A(1)1**
Ashraf, Zohaib **61A(2)115**
Assem, Essam Elsayed **61A(1)19**
Azeem, Musaddaq **61A(2)100**
Badshah, Saeed **61A(2)84; 61A(3)173**
Baladi, Zameer Hussain **61A(3)121**
Begum, Razia **61A(2)106**
Chukwudi, Menkiti Mathew **61A(1)28**
Dawelbeit, Mohamed Said **61A(1)19**
Dominic, Onukwuli Okechukwu **61A(1)28**
Echeng, Walter Peter **61A(1)28**
Fareed, Ghulam **61A(1)15**
Fareed, Nazia **61A(1)15**
Ferheen, Sadia **61A(3)126**
Fraz, Ahmed **61A(2)100**
Gilani, Rubina **61A(3)132**
Goyal, Khushdeep **61A(3)149**
Goyal, Rakesh **61A(3)149**
Haris, Muhammad **61A(3)145**
Harris, Peter **61A(2)59**
Hashmi, Durdana Rais **61A(2)106**
Hassan, Abrar Ul **61A(2)80**
Hassan, Ahmad **61A(3)138**
Hassan, Karim Henikish **61A(2)59**
Hayat, Khizar **61A(3)138**
Hussain, Riaz **61A(3)126**
Imad, Saima **61A(1)8**
Imran, Muhammad **61A(2)84; 61A(3)126; 61A(3)173**
Iqbal, Muhammad **61A(3)126**
Iqbal, Wasif **61A(3)126**
Iqbal, Yaseen **61A(3)145**
Iswantini, Dyah **61A(2)74**
Jarullah, Areej Ali **61A(2)59**
Javed, Asif **61A(2)100**
Javed, Muhammad **61A(1)1**
Kalim, Imran **61A(3)132**
Kazmi, Shahana Urooj **61A(1)15**
Kazmi, Syed Arif **61A(1)8**
Kazmi, Syed Jamil Hasan **61A(3)156**
Khan, Atif **61A(2)115**
Khan, Bushra **61A(1)1**
Khan, Fouzia **61A(1)15**
Khan, Rafiullah **61A(2)84; 61A(3)173**
Kori, Shafi Muhammad **61A(1)35**
Lestari, Wahyuning **61A(2)74**
Mahessar, Ali Asghar **61A(1)35**
Marhoom, Rahma Hamed **61A(1)19**
Masood, Fazal **61A(3)163**

- Masood, Hina **61A(2)91**
Mehmood, Saqib **61A(3)163**
Mitu, Liviu **61A(3)132**
Mohamed, Adel Ashour **61A(1)19**
Mohammed, Salim Jasim **61A(2)66**
Mohyuddin, Ayesha **61A(2)80**
Mraity, Hussien Abid Ali **61A(1)43**
Mughal, Uzma Rasheed **61A(3)126**
Naqvi, Hassan Javed **61A(2)115**
Nisar, Shazia **61A(1)8**
Nosheen, Sofia **61A(1)51**
Nurhidayat, Novik **61A(2)74**
Oladimeji, Azeez Taofik **61A(1)28**
Pervaiz, Muhammad **61A(1)8**
Perveen, Faiza **61A(1)51**
Qureshi, Abdul Latif **61A(1)35**
Qureshi, Zahid **61A(3)138**
Rehman, Zia ur **61A(3)156**
Saadi, Sally Kamil **61A(2)59**
Shahzad, Muhammad **61A(1)56**
Shareef, Akhtar **61A(2)106**
Sheat, Attalla Mohammed **61A(2)66**
Shehzad, Salim **61A(3)163**
Sidhu, Varinder Pal Singh **61A(3)149**
Tufail, Shahid **61A(3)138**
Ullah, Sami **61A(3)145**
Yaqeen, Rafy **61A(3)126**
Yasin, Muhammad **61A(2)96**
Zahid, Sana **61A(2)115**
Zahir, Muhammad **61A(3)138**
Zahoor, Aun **61A(2)96**
Zahra, Naseem **61A(3)132**
Zamir, Umair Bin **61A(2)91**

Pakistan Journal of Scientific and Industrial Research
Series A: Physical Sciences
Volume 61

Subject Index

1-Aminoanthracene-9, 10-Dione, Schiff bases derived from.....	61A(1)15
A bibliometric portrait of PJSIR	61A(3)121
A case study of Indus Delta, Pakistan	61A(3)156
A study of ambient air quality status in Karachi	61A(2)106
Air quality index, a study of ambient air quality	61A(2)106
Ammonium thiocyanate, extraction of gold from	61A(3)145
Analysis of water in the area of District Sahiwal	61A(3)138
Antibacterial potential assessment of Schiff bases	61A(1)15
Antimicrobial evaluation of some new heterocyclic compounds	61A(2)66
Ascorbic acid, thermodynamics and kinetics of	61A(1)8
Characterisation of Patala formation coal reserves	61A(2)96
Chemical constituents from <i>Eremostachys loasifolia</i>	61A(3)126
Cleaning of Dalwal-Punjab coal by using shaking table.....	61A(1)56
Coal fired boiler, hot corrosion study of	61A(3)149
Coal reserves of salt range, characterisation of	61A(2)96
<i>Combretum dolichopetalum</i> Fibre - high density polyethylene (HDPE) composites	61A(1)28
Composite plate, a review on the effect of delamination	61A(3)173
Composites, influence of chemical surface modifications on	61A(1)28
Cracked composite laminated plate, vibration analysis of	61A(2)84
CuO nanoparticles, green synthesis and structural characterisation of	61A(2)59
Dalwal-Punjab coal, cleaning of	61A(1)56
District Sahiwal for heavy metals a case study	61A(3)138
Effect of delamination on the performance of composite plate.....	61A(3)173
Effect of dyeing temperature on the shrinkage and	61A(2)100
Enhanced storage capacity and quality of Haleji and Hadero Lakes	61A(1)35
<i>Eremostachys loasifolia</i> , studies of chemical constituents	61A(3)126
Evaluation of metals and organic contents in eye shadow	61A(1)51
Extraction of gold from boulangrite ore	61A(3)145
Fig leaves extract, green synthesis and structural characterisation	61A(2)59
Gilgit Baltistan, GIS and RS based approach for monitoring	61A(2)91
Gold from boulangrite ore by ammonium thiocyanate	61A(3)145
Green synthesis and structural characterisation of CuO nanoparticles	61A(2)59
Haleji and Hadero Lakes, enhanced storage capacity and	61A(1)35
Heavy metals, analysis of water in	61A(3)138
Heterocyclic compounds, synthesis, characterisation and	61A(2)66
HVOF, sprayed coatings on boiler tube steel	61A(3)149
Indus River, enhanced storage capacity and quality of	61A(1)35
Karachi, a study of ambient air quality status in	61A(2)106
Kufa River, monthly monitoring of	61A(1)43
<i>Lactobacillus plantarum</i> Mar8 on zeolite/ κ -carrageenan membrane.....	61A(2)74

Laminated plate, vibration analysis of	61A(2)84
Land use/Land cover changes through satellite remote sensing	61A(3)156
Lead borate glass doped by V ₂ O ₅ content	61A(1)19
Lead borate glass, structural, electrical and thermal properties of	61A(1)19
Locally available eye shadow products in Lahore, Pakistan	61A(1)51
Mechanical properties of <i>Combretum dolichopetalum</i> fibre (HDPE) composites	61A(1)28
Microfacies analysis of upper permian Wargal Limestone	61A(3)163
Monitoring the snow cover change in Gilgit Baltistan.....	61A(2)91
New heterocyclic compounds using citric acid as a synthon	61A(2)66
PAHs present in the atmosphere of Kot Lakhpat industrial estate of Lahore,	61A(3)132
Pakistan, assessment of polycyclic aromatic hydrocarbons	61A(3)132
Pakistan, diagenetic history and microfacies analysis	61A(3)163
Pakistan, economic analysis of the production of electricity	61A(2)115
Pakistan, evaluation of metals and organic contents in	61A(1)51
Pakistan, Land use/Land cover changes	61A(3)156
Patala formation coal reserves of salt range and its application.....	61A(2)96
Performance of composite plate, effect of delamination.....	61A(3)173
Physicochemical and radiation properties of Kufa River,	61A(1)43
PJSIR during the period of 1958-2007.....	61A(3)121
PJSIR, a bibliometric portrait of	61A(3)121
Polycyclic aromatic hydrocarbons (PAHs) present in the atmosphere	61A(3)132
Polyester/acrylic fabric, effect of dyeing temperature	61A(2)100
Poultry waste, preparation of rechargeable battery	61A(2)80
Preparation of rechargeable battery from poultry waste	61A(2)80
Production of electricity generation and fuel oil	61A(2)115
Radiation properties of Kufa River, monthly monitoring of	61A(1)43
Rechargeable battery from poultry waste.....	61A(2)80
Reduction of Fe(III) acetohydroxamic acid complex	61A(1)8
Renewable resources in Pakistan, economic analysis of	61A(2)115
Schiff base and its Cu(II), Pd(II), Pt(II) complexes	61A(1)1
Schiff bases derived from 1-Aminoanthracene-9, 10-Dione.....	61A(1)15
Shaking table, cleaning of Dalwal-Punjab coal by using.....	61A(1)56
Shrinkage and fastness properties of polyester/acrylic fabric.....	61A(2)100
Snow cover change, GIS and RS based approach	61A(2)91
Structural, electrical and thermal properties of lead borate glass	61A(1)19
Studies of chemical constituents from <i>Eremostachys loasifolia</i>	61A(3)126
Study of high velocity oxy-fuel (HVOF) sprayed coatings	61A(3)149
Synthesis, characterisation and biological activity of Schiff base	61A(1)1
Thermodynamics and kinetics of reduction of Fe(III)	61A(1)8
Tyrosine and aromatic aldehyde, synthesis characterisation and.....	61A(1)1
Uric acid biosensor using immobilised <i>Lactobacillus plantarum</i>	61A(2)74
Vibration analysis of cracked composite laminated plate	61A(2)84
Wargal Limestone in the Central Salt Range, Pakistan.....	61A(3)163
Zeolite/ κ -carrageenan membrane uric acid biosensor	61A(2)74

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