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Special Paper

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

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(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

Pak. j. sci. ind. res. Ser. A: phys. sci. 2018 **61A**(3) 126-131

Studies of Chemical Constituents from *Eremostachys loasifolia*

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(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-4methoxy 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

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

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(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 PM_{10} was 144.300. The concentration of $PM_{2.5}$ was 534.390 ng/m^3/h and 12825 ng/m^3/day, while concentration of PM_{10} was 4180 ng/m^3/h and 115440 ng/m^3/day. Gas chromatography was used for the quantification of 16 different PAHs. The mean total quantity of PAHs in air was 742.030 ng/m^3 on the basis of total particulate matter. The mean concentration of dibenzo(a,h) anthracene was highest i.e. 123.370 ng/m^3 with 10.660 ng/m^3 minimum and 236.080 ng/m^3 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

Pak. j. sci. ind. res. Ser. A: phys. sci. 2018 **61A**(3) 138-144

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

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(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

Pak. j. sci. ind. res. Ser. A: phys. sci. 2018 **61A**(3) 145-148

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

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

Abstract. In this study extraction of gold from Boulangerite ore ($Pb_5Sb_4S_{11}$) via ahydrometallurgical 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

Pak. j. sci. ind. res. Ser. A: phys. sci. 2018 **61A**(3) 149-155

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

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(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-Cr_3C_2)-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-Cr_3C_2)-7Ni coating was better on ASME SA213 T22.

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

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

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(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 km^2 (23.21 km^2/year), 749.44 km^2 (53.53km^2/year), 171.01 km^2 (12.21 km^2/year), 375.31 km^2 (26.81 km^2/year) and 59 km^2 (4.21 km^2/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 km^2 (0.93 km2/year), 280.58 km^2 (20.04 km^2/year), 290.54 km^2 (20.75 km^2/year), 844.59 km^2 (60.33 km^2/year) and 237.16 km^2 (16.94 km^2/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.

Pak. j. sci. ind. res. Ser. A: phys. sci. 2018 **61A**(3) 163-172

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

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(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

Pak. j. sci. ind. res. Ser. A: phys. sci. 2018 **61A**(3) 173-182

Review

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

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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

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Park (2005), Aksu and Kabasakal (2004) and Evans *et al.* (2000)
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In "List" References :

Evans, W.J., Johnson, M.A., Fujimoto, Cy. H., Greaves, J. 2000. Utility of electrospray mass spectrometry for the characterization of air-sensitive organolan-thanides and related species. *Organometallics,* **19:** 4258-4265.

For Standards:

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*SIC, 2016. Annual Report, 2014-15,*Scientific Information Centre, Pakistan Council of Scientific and Industrial Research, PCSIR Laboratories Campus, Shahrah-e-Dr. Salimuzzaman Siddiqui, Karachi, Pakistan.

Thesis:

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