

# **Pakistan Journal of Scientific and Industrial Research**

**Series A: Physical Sciences**

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**Pakistan Journal of Scientific and Industrial Research**  
**Series A: Physical Sciences**  
**Vol. 59, No. 3, September-October, 2016**

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**Contents**

<b>Effect of Storage on Physicochemical Characteristics of Some Selected Vegetable Oils</b> Zahida Karim, Farhat Ikram, Aneela Karim and Khalid Mohammed Khan	121
<b>Chemical Characterization of Unrefined Rock Salt Deposits of Pakistan</b> Abrar ul Hassan, Sakhawat Ali, Ayesha Mohy Udd Din and Salman Muhsen	126
<b>Beneficiation Studies on Low-Grade Complex Polymetallic Lead-Zinc Ore of Duddar (Lasbela) Balochistan, Pakistan</b> Muhammad Arif Bhatti, Kamran Raza Kazmi, Abdul Ahad, Anila Tabassum, Rashid Mehmood and Adnan Akram	130
<b>The Effect of Wrinkle Recovery Finishes on Shrinkage of Cotton Fabric for Different Finish Applying Techniques</b> Muhammad Qamar Tusief, Nabeel Amin, Zahid Hussain and Muhammad Saddique	144
<b>Removal of COD in Purified Terephthalic Acid (PTA) Effluent with Coagulation, Aqueous Oxidation and High Porosity Membrane</b> Niaz Ahmed Memon, Nisar Ahmed, Sarwat Ismail, Nusrat Jalbani, Uzma Asghar, Tahira Ayaz and Razia Begum	151
<b>Drinking Water Quality in Urban Areas of Pakistan: A Case Study of Gujranwala City</b> Sajjad Haydar, Obaidullah Nadeem, Ghulam Hussain, Haroon Rashid and Rashid Majeed	157
<b>Impact of Urbanization on Inflows and Water Quality of Rawal Lake</b> Muhammad Awais, Muhammad Afzal, Massimiliano Granceri and Muhammad Saleem	167
<b>Ambient Air Quality of Karachi City as Reflected by Atmospheric Particulate Matter (PM<sub>10</sub>) Concentrations</b> Durdana Rais Hashmi and Akhtar Shareef	173
<b>Contents of Volume 59, Ser. A: Phys. Sci. (No.1-3)</b>	(i)
<b>Author Index of Volume 59, Ser. A: Phys. Sci. (No.1-3)</b>	(iv)
<b>Subject Index of Volume 59, Ser. A: Phys. Sci. (No.1-3)</b>	(vi)

## Effect of Storage on Physicochemical Characteristics of Some Selected Vegetable Oils

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(received April 21, 2015; revised August 20, 2015; accepted August 21, 2015)

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**Abstract.** The quality of fats and oils is analysed by several physical and chemical parameters that are dependent on the source of oil as well as processing and storage conditions. In the present study, refractive index, peroxide, saponification, and acid values of different branded and unbranded vegetable oils were determined. Storage stability of oil samples were investigated and fastest deterioration was observed when samples were exposed to day light. UV radiations also caused oxidative damage, as indicated by the increased peroxide values for the samples exposed to UV radiations for 0, 5 and 10 min, respectively. Direct sunlight and UV rays are particularly found responsible for the degradation of oil quality.

**Keywords:** peroxide value, refractive index, saponification value, storage stability, UV radiations, vegetable oil

---

## Chemical Characterisation of Unrefined Rock Salt Deposits of Pakistan

**Abrar ul Hassan<sup>a\*</sup>, Sakhawat Ali<sup>b</sup>, Ayesha Mohy Udd Din<sup>a</sup> and Salman Muhsen<sup>a</sup>**

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(received August 19, 2015; revised April 8, 2016; accepted April 15, 2016)

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**Abstract.** Different salt samples from mining sites of Bahadur Khel, Warcha and Jatta salt mines were collected during a survey to evaluate their parameters of purity like water insoluble matter, calcium, magnesium, sulphate and potassium contents. Trace elements such as iron, zinc, copper, manganese, chromium, lead and cadmium were determined by using Atomic absorption Spectrophotometer. Obtained results have shown that of all the three salt deposits, Bahadur Khel salt deposits have a of low purity of 97% set by codex alimentarius commission. Trace element contents of all the salt deposits were within the legal limits of human consumption and RDA specification.

**Keywords:** atomic absorption spectroscopy, rock salt, moisture content, trace elements

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## **Beneficiation Studies on Low-Grade Complex Polymetallic Lead-Zinc Ore of Duddar (Lasbela) Balochistan, Pakistan**

**Muhammad Arif Bhatti<sup>a\*</sup>, Kamran Raza Kazmi<sup>a</sup>, Abdul Ahad<sup>b</sup>, Anila Tabassum<sup>c</sup>,  
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(received January 23, 2015; revised August 6, 2015; accepted October 7, 2015)

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**Abstract:** A bench-scale beneficiation study was performed on low-grade complex lead-zinc ore of Duddar area, District Lasbela, Balochistan Province, Pakistan. The polymetallic ore under investigation contains galena and sphalerite as valuable minerals of lead and zinc. The low-grade ore was upgraded by selective sequential froth flotation technology to recover both minerals. An effort was made to investigate the effect of important variables on grade and recovery of concentrates and to design the process flow sheet. Different parameters of flotation process such as particle size of the feed, pH and % solids of the pulp, speed of impeller, type of reagents (collectors, frothers, regulators and modifiers) and their quantities, conditioning time and flotation time were optimized to attain maximum grade and recovery of respective concentrates. The rougher concentrates obtained were subjected to one regrinding and two cleaning operations to achieve higher-grade concentrates of both metals. Bench-scale flotation tests show that it is possible to obtain a lead concentrate assaying 65.24% Pb with recovery rate of 81.32% and a zinc concentrate containing 55.63% Zn content with recovery rate of 80.28%. Both the concentrates meet the specifications required for metallurgical and chemical grades.

**Keywords:** low grade, lead-zinc ore, galena, sphalerite, beneficiation, froth flotation, grade, recovery

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## The Effect of Wrinkle Recovery Finishes on Shrinkage of Cotton Fabric for Different Finish Applying Techniques

Muhammad Qamar Tusief<sup>a\*</sup>, Nabeel Amin<sup>b</sup>, Zahid Hussain<sup>c</sup> and Muhammad Saddique<sup>a</sup>

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(received August 31, 2015; revised November 13, 2015; accepted November 18, 2015)

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**Abstract.** This research study was conducted to make wrinkle free fabric by applying formaldehyde free anti-wrinkle finishes like Texicil DC, Knittex RCT, Arkofix NEC, Arkofix ELF. In this effort, various concentrations of these finishes were used by adopting three different finish applying techniques (pad-dry technique, pad-dry-cure technique and pad-flash-cure technique) on pure cotton fabric in order to optimize their application for best manufacturing results in sense of the shrinkage ability of the fabric. After making quality test of the resulting fabric it was depicted that pad dry method of applying finish proved itself better as compared to other techniques adopted in this research, while the finish Arkofix ELF and Arkofix NEC at concentration level of 120 g/L gave better results in respect of shrinkage of the fabric.

**Keywords:** non formaldehyde finishes, finishing techniques, cotton fabric, wrinkle free, fabric shrinkage

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## Removal of COD in Purified Terephthalic Acid (PTA) Effluent with Coagulation, Aqueous Oxidation and High Porosity Membrane

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(received June 18, 2015; revised January 25, 2016; accepted March 16, 2016)

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**Abstract.** Present study was focused on purified terephthalic acid (PTA) industry wastewater treatment located at Port Qasim, Karachi. PTA wastewater containing high COD (100000 to 150000 mg/L) was treated with coagulate ferrous ion and then was oxidized independently with aqueous hydrogen peroxide using different doses at 45 °C for 1h. The resulting wastewater was passed through RO plant equipped with high porosity bio-ceramic membrane. It was observed that coagulation and oxidation processes have potential to reduce 87.9% COD but complete reduction up to 99.8% was achieved after passing the effluents from high RO plant equipped with high porosity ceramic membrane.

**Keywords:** COD reduction, coagulation, active oxidation, ceramic membrane, purified terephthalic acid

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## **Drinking Water Quality in Urban Areas of Pakistan: A Case Study of Gujranwala City**

**Sajjad Haydar<sup>a</sup>, Obaidullah Nadeem<sup>b\*</sup>, Ghulam Hussain<sup>a</sup>, Haroon Rashid<sup>a</sup>  
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(received December 8, 2014; revised October 14, 2015; accepted October 15, 2015)

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**Abstract.** A study was conducted to evaluate the drinking water quality of Gujranwala city. Samples were collected from 16 locations including: 4 tube wells, 4 overhead reservoirs (OHR) and 8 house connections. Twelve physicochemical and two bacteriological parameters were tested, before and after monsoon and compared with National Standards for Drinking Water Quality (NSDWQ). The results demonstrated that most of the physicochemical parameters, except lead, nickle and chromium were within NSDWQ before and after monsoon. Bacteriological and heavy metal contamination was found before and after the monsoon. Possible reasons of contamination are: no disinfection, old and leaking water pipes, poor drainage during monsoon and possible cross connections between water and sewerage lines. It is recommended to practice disinfection, laying of water and sewerage pipes on opposite sides of streets and periodic water quality monitoring.

**Keywords:** water quality, physicochemical characteristics, bacteriological characteristics

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## Impact of Urbanization on Inflows and Water Quality of Rawal Lake

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(received September 9, 2015; revised November 15, 2015; accepted December 7, 2015)

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**Abstract.** Two phenomena playing important role in affecting water resources all over the world are: urbanization and climate changes. Urban and peri-urban water bodies are very vulnerable to these phenomena in terms of quality and quantity protection. This study was aimed to perceive the impact of ever-increasing urbanization on water quality in the catchment area of Rawal Lake. Rawal Lake supplies water for domestic use to Rawalpindi city and Cantonment area. The water was found biologically unfit for human consumption due to total and faecal coliformus counts higher than WHO limits. Similarly, turbidity and calcium was more than WHO standards. There should be detailed study on climate change parallel to urbanization in the Rawal catchment to quantify its impacts on water quality and inflows.

**Keywords:** urbanization, inflows, water quality, Rawal Lake, Korang River

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# Ambient Air Quality of Karachi City as Reflected by Atmospheric Particulate Matter (PM<sub>10</sub>) Concentrations

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(received July 22, 2015; revised November 30, 2015; accepted December 1, 2015)

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**Abstract:** The present study examines the variation of ambient aerosol (PM<sub>10</sub>) concentrations in Karachi, city. Samples were collected from ten different locations, representative of urban background, residential, traffic and industrial areas from 2007 to 2011. At each location, PM<sub>10</sub> was measured continuously from 08:00 am to 06:00 pm at local time. The maximum 10 h average particulate matter (PM<sub>10</sub>) mass concentrations were found at Tibet Centre (440.1 µg/m<sup>3</sup>) and minimum at PCSIR Campus (21.7 µg/m<sup>3</sup>) during 2008. A rising trend during 2008 may be due to the civil works for bridges and extension of roads at different locations in Karachi. The results also suggest that urban traffic and industrial areas appeared to have higher PM<sub>10</sub> concentration than residential and background areas.

**Keywords:** PM<sub>10</sub>, annual averages, statistics, co-relation

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**Pakistan Journal of Scientific and Industrial Research**  
**Series A: Physical Sciences**  
**Volume 59**

**Contents**

**Series A: Physical Sciences**

**Vol. 59, No.1, January - February, 2016**

<b>Preparation, Characterisation and Photocatalytic Activity of La-doped ZnO Nanopowders Synthesised using Auto-Combustion</b> Makhtar Ahmad, Eijaz Ahmed, Muhammad Ikram, Zhanglian Hong, Abdul Hafeez, Khalid Nadeem Riaz, Fezza Zafar, Niaz Ahmed Niaz and Waqar Ahmed	1
<b>Kinetics of Adsorptive Removal of Drimarene Brilliant Red from Aqueous Solution Using Untreated Agricultural Residues</b> Ch. Tahir Mehmood, Muhammad Arshad, Tayyab Ashfaq, Muhammad Bilal, Muhammad Shafiq and Kiran Hina	11
<b>Synthesis and Application of Highly Active Dithioamide Functionalised Multi-Walled Carbon Nanotubes Toward Mercury Removal from Aqueous Solution</b> Mirabi Ali, Shokuhi Rad Ali, Siadati Seyyed Amir and Alavi Tabari Seyyed Ali	23
<b>Remote Controlling and Monitoring of Microscopic Slides</b> Ghulam Mustafa, Muhammad Tahir Qadri and Umar Daraz	30
<b>Seasonal and Temporal Variations of Criteria Air Pollutants and the Influence of Meteorological Parameters on the Concentration of Pollutants in Ambient Area in Lahore, Pakistan</b> Amtul Bari Tabinda, Saleha Munir, Abdullah Yasar and Asad Ilyas	34
<b>Evaluation of Groundwater Quality of Selected Boreholes in Ohaozara and Ivo Council Areas of Ebonyi State, Nigeria</b> Omaka Ndukaku Omaka, Ifeanyi Francis Offor, David Obasi Igwe and Ewuzie Ugochukwu	43
<b>The Comfort of Knitted Fabric as Affected by its Structure</b> Muhammad Qamar Tusief, Nabeel Amin, Mudassar Abbas and Zahid Hussain	52
<b>Short Communications</b>	
<b>An Investigation into the <i>In situ</i> Preparation of Hetero Bifunctional Monochlorotriazinyl-Vinyl Sulphone Reactive Dyes for Cotton</b> Khalid Pasha and John Anthony Taylor	56

<b>Activated Sludge Process and its Suitability for Treatment of Tannery Waste Water</b> Niaz Ahmed Memon, Nisar Ahmed, Nusrat Jalbani, Tahira Ayaz, Razia Bagum and Alia Bano Munshi	<b>60</b>
---	-----------

### **Vol. 59, No.2, May - June, 2016**

<b>(E)-N'-(2,4-dihydroxybenzylidene)nicotinohydrazide and its Metal Complexes: Synthesis, Characterisation and Antitubercular Activity</b> Kehinde Olurotimi Ogunniran, Joseph Adeyemi Adekoya, Cyril Ehi-Eromosele, Olayinka Oyewale Ajani, Akinlolu Kayode and Tadigoppula Narendar	<b>63</b>
---	-----------

<b>Quantification of Cr(VI)-Thymoquinone Complex Using Cyclic Voltammetry</b> Farah Kishwar, Khalid Mohammed Khan, Rubina Perween, Anila Anwar and Nasir Akhtar	<b>76</b>
--	-----------

<b>Effect of Processing on Physicochemical Properties and Fatty Acid Composition of Fluted Pumpkin (<i>Telfairia occidentalis</i>) Seed Oil</b> Jacob Olabode Alademeyin and Jacob Olalekan Arawande	<b>83</b>
---	-----------

<b>Liberation Studies of Padhrar Coal by Using Fractionation Method, XRD Analysis and Megascopic and Microscopic Techniques</b> Muhammad Shahzad, Zulfiqar Ali, Yasir Majeed, Zaka Emad, Muhammad Aaqib and Bilal Adeel	<b>90</b>
---	-----------

<b>Modeling the Land Suitability Using GIS and AHP for Cotton Cultivation in Punjab, Pakistan</b> Nabila Naz and Haroon Rasheed	<b>96</b>
--	-----------

<b>Quality Variation Minimizer: A New Approach for Quality Improvement in textile industry</b> Muhammad Amin, Muhammad Amanullah and Atif Akbar	<b>109</b>
--	------------

<b>Effect of Different Processing Stages on the Crystallinity % and Tensile Strength of 100% Cotton Fabric</b> Zahid Hussain, Muhammad Qamar Tusief, Sharjeel Abid, Muhammad Tauseef Khawer, Nabeel Amin and Mudassar Abbas	<b>114</b>
---	------------

### **Short Communication**

<b>Biosorption Characteristics of Water Hyacinth (<i>Eichhornia crassipes</i>) in the Removal of Nickel (II) Ion under Isothermal Condition</b> Chidi Obi and Sylvester Eighbiremonlen	<b>118</b>
---	------------

### **Vol. 59, No.3, September - October, 2016**

<b>Effect of Storage on Physicochemical Characteristics of Some Selected Vegetable Oils</b> Zahida Karim, Farhat Ikram, Aneela Karim and Khalid Mohammed Khan	<b>121</b>
--	------------

<b>Chemical Characterization of Unrefined Rock Salt Deposits of Pakistan</b> Abrar ul Hassan, Sakhawat Ali, Ayesha Mohy Udd Din and Salman Muhsen	126
<b>Beneficiation Studies on Low-Grade Complex Polymetallic Lead-Zinc Ore of Duddar (Lasbela) Balochistan, Pakistan</b> Muhammad Arif Bhatti, Kamran Raza Kazmi, Abdul Ahad, Anila Tabassum, Rashid Mehmood and Adnan Akram	130
<b>The Effect of Wrinkle Recovery Finishes on Shrinkage of Cotton Fabric for Different Finish Applying Techniques</b> Muhammad Qamar Tusief, Nabeel Amin, Zahid Hussain and Muhammad Saddique	144
<b>Removal of COD in Purified Terephthalic Acid (PTA) Effluent with Coagulation, Aqueous Oxidation and High Porosity Membrane</b> Niaz Ahmed Memon, Nisar Ahmed, Sarwat Ismail, Nusrat Jalbani, Uzma Asghar, Tahira Ayaz and Razia Begum	151
<b>Drinking Water Quality in Urban Areas of Pakistan: A Case Study of Gujranwala City</b> Sajjad Haydar, Obaidullah Nadeem, Ghulam Hussain, Haroon Rashid and Rashid Majeed	157
<b>Impact of Urbanization on Inflows and Water Quality of Rawal Lake</b> Muhammad Awais, Muhammad Afzal, Massimiliano Granceri and Muhammad Saleem	167
<b>Ambient Air Quality of Karachi City as Reflected by Atmospheric Particulate Matter (PM<sub>10</sub>) Concentrations</b> Durdana Rais Hashmi and Akhtar Shareef	173
<b>Contents of Volume 59, Ser. A: Phys. Sci. (No.1-3)</b>	(i)
<b>Author Index of Volume 59, Ser. A: Phys. Sci. (No.1-3)</b>	(iv)
<b>Subject Index of Volume 59, Ser. A: Phys. Sci. (No.1-3)</b>	(vi)

**Pakistan Journal of Scientific and Industrial Research**  
**Series A: Physical Sciences**  
**Volume 59**  
**Author Index**

- Aaqib, Muhammad **59A(2)90**  
Abbas, Mudassar **59A(1)52; 59A(2)114**  
Abid, Sharjeel **59A(2)114**  
Adeel, Bilal **59A(2)90**  
Adekoya, Joseph Adeyemi **59A(2)63**  
Afzal, Muhammad **59A(3)167**  
Ahad, Abdul **59A(3)130**  
Ahmad, Mukhtar **59A(1)1**  
Ahmed, Eijaz **59A(1)1**  
Ahmed, Nisar **59A(1)60; 59A(3)151**  
Ahmed, Waqar **59A(1)1**  
Ajani, Olayinka Oyewale **59A(2)63**  
Akbar, Atif **59A(2)109**  
Akhtar, Nasir **59A(2)76**  
Akram, Adnan **59A(3)130**  
Alademeyin, Jacob Olabode **59A(2)83**  
Ali, Alavi Tabari Seyyed **59A(1)23**  
Ali, Mirabi **59A(1)23**  
Ali, Sakhawat **59A(3)126**  
Ali, Shokuhi Rad **59A(1)23**  
Ali, Zulfiqar **59A(2)90**  
Amanullah, Muhammad **59A(2)109**  
Amin, Muhammad **59A(2)109**  
Amin, Nabeel **59A(1)52; 59A(2)114; 59A(3)144**  
Amir, Siadati Seyyed **59A(1)23**  
Anwar, Anila **59A(2)76**  
Arawande, Jacob Olalekan **59A(2)83**  
Arshad, Muhammad **59A(1)11**  
Asghar, Uzma **59A(3)151**  
Ashfaq, Tayyab **59A(1)11**  
Awais, Muhammad **59A(3)167**  
Ayaz, Tahira **59A(1)60; 59A(3)151**  
Bagum, Razia **59A(1)60; 59A(3)151**  
Bhatti, Muhammad Arif **59A(3)130**  
Bilal, Muhammad **59A(1)11**  
Daraz, Umar **59A(1)30**  
Ehi-Eromosele, Cyril **59A(2)63**  
Egbiremonlen, Sylvester **59A(2)118**  
Emad, Zaka **59A(2)90**  
Granceri, Massimiliano **59A(3)167**  
Hafeez, Abdul **59A(1)1**  
Hashmi, Durdana Rais **59A(3)173**  
Hassan, Abrar ul **59A(3)126**  
Haydar, Sajjad **59A(3)157**  
Hina, Kiran **59A(1)11**  
Hong, Zhanglian **59A(1)1**  
Hussain, Ghulam **59A(3)157**  
Hussain, Zahid **59A(1)52; 59A(2)114; 59A(3)144**  
Igwe, David Obasi **59A(1)43**  
Ikram, Farhat **59A(3)121**  
Ikram, Muhammad **59A(1)1**  
Ilyas, Asad **59A(1)34**  
Jalbani, Nusrat **59A(1)60; 59A(3)151**  
Karim, Aneela **59A(3)121**  
Karim, Zahida **59A(3)121**  
Kayode, Akinlolu **59A(2)63**  
Kazmi, Kamran Raza **59A(3)130**  
Khan, Khalid Mohammed **59A(2)76**  
Khan, Khalid Mohammed **59A(3)121**  
Khawer, Muhammad Tauseef **59A(2)114**  
Kishwar, Farah **59A(2)76**  
Majeed, Rashid **59A(3)157**  
Majeed, Yasir **59A(2)90**  
Mehmood, Ch. Tahir **59A(1)11**  
Mehmood, Rashid **59A(3)130**  
Memon, Niaz Ahmed **59A(1)60; 59A(3)151**  
Mohy Udd Din, Ayesha **59A(3)126**  
Muhsen, Salman **59A(3)126**



- Munir, Saleha **59A(1)34**  
Munshi, Alia Bano **59A(1)60**  
Mustafa, Ghulam **59A(1)30**  
Nadeem, Obaidullah **59A(3)157**  
Narender, Tadigoppula **59A(2)63**  
Naz, Nabila **59A(2)96**  
Niaz, Ahmed Niaz **59A(1)1**  
Obi, Chidi **59A(2)118**  
Offor, Ifeanyi Francis **59A(1)43**  
Ogunniran, Kehinde Olurotimi **59A(2)63**  
Omaka, Omaka Ndukaku **59A(1)43**  
Pasha, Khalid **59A(1)56**  
Perween, Rubina **59A(2)76**  
Qadri, Muhammad Tahir **59A(1)30**  
Rasheed, Haroon **59A(2)96**  
Rashid, Haroon **59A(3)157**  
Riaz, Khalid Nadeem **59A(1)1**  
Saddique, Muhammad **59A(3)144**  
Saleem, Muhammad **59A(3)167**  
Shafiq, Muhammad **59A(1)11**  
Shahzad, Muhammad **59A(2)90**  
Shareef, Akhtar **59A(3)173**  
Tabbassum, Anila **59A(3)130**  
Tabinda, Amtul Bari **59A(1)34**  
Taylor, John Anthony **59A(1)56**  
Tusief, Muhammad Qamar **59A(1)52; 59A(2)114; 59A(3)144**  
Ugochukwu, Ewuzie **59A(1)43**  
Yasar, Abdullah **59A(1)34**  
Zafar, Fezza **59A(1)1**

**Pakistan Journal of Scientific and Industrial Research**  
**Series A: Physical Sciences**  
**Volume 59**  
**Subject Index**

Activated sludge process for treatment of tannery waste water .....	59A(1)60
Agricultural residues, kinetics of adsorptive removal of.....	59A(1)11
Air pollutants, seasonal and temporal variations of .....	59A(1)34
Ambient air quality of Karachi city .....	59A(3)173
Antitubercular activity, synthesis ( <i>E</i> )- <i>N'</i> -(2,4-dihydroxybenzylidene)nicotinohydrazide .....	59A(2)63
Aqueous solution, kinetics of adsorptive removal of .....	59A(1)11
Aqueous solution, synthesis and application of .....	59A(1)23
Atmospheric particulate matter (PM <sub>10</sub> ) concentrations .....	59A(3)173
Auto-combustion, preparation, characterisation and.....	59A(1)1
Beneficiation studies on lead-zinc ore.....	59A(3)130
Biosorption characteristics of water hyacinth .....	59A(2)118
Boreholes in Ohaozara and Ivo council areas of Ebonyi State, Nigeria .....	59A(1)43
Carbon nanotubes toward mercury removal from aqueous solution.....	59A(1)23
Chemical characterization of unrefined rock salt .....	59A(3)126
Coal, liberation studies of .....	59A(2)90
COD in purified terephthalic acid (PTA) effluent .....	59A(3)151
Concentration of pollutants in ambient area in Lahore, Pakistan.....	59A(1)34
Cotton cultivation, modeling the hand suitability .....	59A(2)96
Cotton fabric, effect of different processing stages on .....	59A(2)114
Cotton fabric, the effect of wrinkle recovery .....	59A(3)144
Cotton, an investigation into .....	59A(1)56
Cr(VI)-thymoquinone complex, quantification of .....	59A(2)76
Crystallinity % and tensile strength of 100% cotton fabric.....	59A(2)114
Cyclic voltammetry, quantification of .....	59A(2)76
Dithioamide functionalised multi-walled carbon nanotubes .....	59A(1)23
Drinking water quality in urban areas of Pakistan .....	59A(3)157
( <i>E</i> )- <i>N'</i> -(2,4-dihydroxybenzylidene)nicotinohydrazide synthesis .....	59A(2)63
Evaluation of groundwater quality of selected boreholes .....	59A(1)43
Fatty acid composition of fluted pumpkin .....	59A(2)83
Finish applying techniques, the effect of .....	59A(3)144
Fluted pumpkin ( <i>Telfairia occidentalis</i> ) seed oil.....	59A(2)83
Fractionation method, liberation studies of Padhrar coal .....	59A(2)90
GIS and AHP for cotton cultivation .....	59A(2)96
Groundwater quality of selected boreholes, evaluation of .....	59A(1)43
Gujranwala city, drinking water quality in .....	59A(3)157
Inflows and water quality of Rawal Lake .....	59A(3)167
Karachi city, ambient air quality of .....	59A(3)173
Kinetics of adsorptive removal of Drimarene Brilliant Red .....	59A(1)11
Knitted fabric, the comfort of as .....	59A (1)52
Land suitability for cotton cultivation .....	59A(2)96
Lead-zinc ore of Duddar (Lasbela) Balochistan, Pakistan .....	59A(3)130

Liberation studies of Padhrar coal .....	<b>59A(2)90</b>
Mercury removal from aqueous solution .....	<b>59A(1)23</b>
Metal complexes, ( <i>E</i> )- <i>N'</i> -(2,4-dihydroxybenzylidene)nicotinohydrazide .....	<b>59A(2)63</b>
Microscopic slides, remote controlling and .....	<b>59A(1)30</b>
Microscopic techniques, liberation studies of Padhrar coal .....	<b>59A(2)90</b>
Monitoring of microscopic slides, remote controlling and .....	<b>59A(1)30</b>
Monochlorotriazinyl-vinyl sulphone reactive dyes for cotton .....	<b>59A(1)56</b>
Pakistan, chemical characterization of unrefined rock salt .....	<b>59A(3)126</b>
Pakistan, drinking water quality in urban areas .....	<b>59A(3)157</b>
Pakistan, modeling the land suitability using GIS and .....	<b>59A(2)96</b>
Pakistan, polymetallic lead-zinc ore of .....	<b>59A(3)130</b>
Pakistan, seasonal and temporal variations of .....	<b>59A(1)34</b>
Photocatalytic Activity of La-doped ZnO nanopowders .....	<b>59A(1)1</b>
Physicochemical characteristics of some selected vegetable oils .....	<b>59A(3)121</b>
Physicochemical properties of fluted pumpkin ( <i>Telfairia occidentalis</i> ) seed oil .....	<b>59A(2)83</b>
Purified terephthalic acid (PTA) effluent, removal of COD .....	<b>59A(3)151</b>
Quality improvement in textile industry .....	<b>59A(2)109</b>
Quality variation minimizer: A new approach .....	<b>59A(2)109</b>
Quantification of Cr(VI)-thymoquinone complex .....	<b>59A(2)76</b>
Rawal Lake, impact of urbanization .....	<b>59A(3)167</b>
Reactive dyes for cotton, an investigation into .....	<b>59A(1)56</b>
Remote controlling and monitoring of microscopic slides.....	<b>59A(1)30</b>
Removal of COD in purified terephthalic acid (PTA) effluent .....	<b>59A(3)151</b>
Removal of Drimarene Brilliant Red from aqueous solution.....	<b>59A(1)11</b>
Removal of nickel (II) ion, biosorption characteristics of water hyacinth .....	<b>59A(2)118</b>
Seed oil, effect of processing on .....	<b>59A(2)83</b>
Shrinkage of cotton fabric for different finish applying techniques .....	<b>59A(3)144</b>
Some selected vegetable oils, effect of .....	<b>59A(3)121</b>
Structure, the comfort of knitted fabric.....	<b>59A (1)52</b>
Tannery waste water, activated sludge .....	<b>59A(1)60</b>
Tensile strength of 100% cotton fabric.....	<b>59A(2)114</b>
Textile industry, quality variation minimizer .....	<b>59A(2)109</b>
The comfort of knitted fabric as affected by its structure .....	<b>59A(1)52</b>
The effect of wrinkle recovery finishes on .....	<b>59A(3)144</b>
Treatment of tannery waste water, activated sludge.....	<b>59A(1)60</b>
Unrefined rock salt, chemical characterization of .....	<b>59A(3)126</b>
Vegetable oils, effect of storage on .....	<b>59A(3)121</b>
Water hyacinth ( <i>Eichhornia crassipes</i> ), biosorption characteristics of .....	<b>59A(2)118</b>
Water quality of Rawal Lake .....	<b>59A(3)167</b>
XRD analysis, liberation studies of Padhrar coal .....	<b>59A(2)90</b>
ZnO nanopowders synthesised using auto-combustion .....	<b>59A(1)1</b>

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