

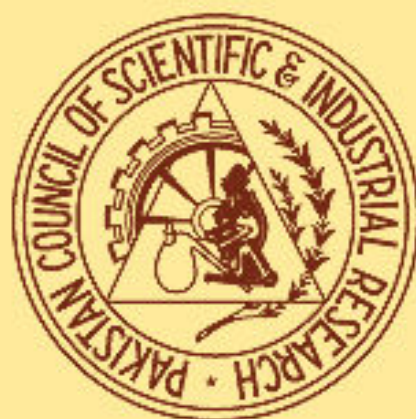
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Potential for Underground Gasification of Pakistani Lignite Coal

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Abstract. Laboratory scale process of underground gasification of Pakistani lignite has been performed to check the potential of the Pakistani coal for gasification. High permeability and low swelling index of coal are desirable properties for UCG. In Pakistani lignite both properties are found and in case of lignite and brown coal, natural permeability provides adequate linkage. The proximate and ultimate compositions of the samples show that it is of low quality coal with high volatile matter. Coal has been converted into syngas and utilized as the substitute of natural gas and for power generation.

Keywords: underground coal gasification, syngas, Pakistani lignites, Thar coal

Beneficiation Studies on Low-Grade Tungsten Ore of Chitral, Khyber Pukhtunkhwa, Pakistan

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Lahore-54600, Pakistan

(received March 15, 2010; revised February 06, 2011; accepted February 21, 2011)

Abstract. A bench-scale investigation was carried out for the beneficiation of tungsten ore of Chitral, Khyber Pukhtunkhwa, Pakistan. The ore initially containing 0.55% WO_3 was upgraded by applying a combination of physical beneficiation techniques i.e gravity concentration and magnetic separation. Diagonal Deck Concentration Table was used for gravity concentration studies. A series of tests was performed and the effect of various process variables such as feed rate, wash water flow rate, deck inclination angle and stroke length was studied. The experiments were conducted according to the traditional single-factor experimentation in order to get the real optimum conditions of processing. At optimum conditions, a tungsten concentrate having a grade of 30.85% WO_3 with 75.72% recovery was obtained. This concentrate was further upgraded by magnetic separation to 34.11% WO_3 with more than 75.72% recovery.

Keywords: Tungsten ore, gravity concentration, magnetic separation, scheelite concentrate

Antioxidant Activity Directed Isolations from *Punica granatum*

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(received April 12, 2010; revised August 19, 2011; accepted August 26, 2011)

Abstract. The extracts derived from pomegranate juice following antioxidant activity directed isolation were screened for their antioxidant activity through their ability to scavenge 2,2- diphenyl-1-picrylhydrazyl (DPPH) radicals. Only fractions which exhibited >50% DPPH scavenging effect at each step of isolation were selected for further purification and their ability to reduce peroxide formation (peroxide value) in heated corn oil. Phytochemical analysis of the pure compounds finally obtained, revealed the presence of pelargonidin-3- galactose (Pg-3-galactose), cyanidin-3-glucose (Cy-3-Glucose), gallic acid, quercetin and myricetin in the fractions exhibiting >50% DPPH scavenging potential. The order of antioxidant activity of these pure compounds by DPPH method was found to be gallic acid> quercetin> myricetin> Cy-3-galactose> Pg-3-Glucose while order with respect to reduction in peroxide value (PV) was the reverse of DPPH.

Keywords: *Punica granatum*, antioxidant activity, pelargonidin-3-galactose, cyanidin-3glucose, gallic acid, quercetin, myricetin

Imatinib Quantification by Liquid Chromatography Ultraviolet Detection for Monitoring of Plasma Levels

Sameh Trabelsi, Hanene Eljebari, Amna Kooli, Emna Gaies, Rim Sahnoun, Nadia Jebabli, Mohamed Lakhel and Anis Klouz*

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(received October 17, 2010; revised May 19, 2011; accepted May 23, 2011)

Abstract. Imatinib is a new anticancer agent which acts by selectivity inhibiting the Abl tyrosine kinase and has a striking antitumor activity in patient with chronic myelogenous leukemia (CML). In this study a rapid and sensitive High Pressure Liquid Chromatography (HPLC) method has been developed with UV detection for estimation of Imatinib from the plasma of CML patients. Samples were prepared in a simple and single step by precipitation of plasma proteins with methanol. Calibration plots in spiked plasma were linear in a concentration range of 500-4000 ng/mL. Inter and intra-day coefficient of variation (precision) and bias (accuracy) were <10%. Limit of detection (LOD) and limit of quantification (LOQ) of Imatinib were 125.41 ng/mL and 380 ng/mL, respectively. Mean recovery of Imatinib ranged from 93.84 % to 109.68 %. The cross validation showed that the number of samples within a 20% difference from reference value was 19 out of 24 samples. Method developed is flexible and may be useful for analysing clinical samples containing Imatinib.

Keywords: Imatinib, liquid chromatography, plasma level monitoring

Novel Complexes of Molybdenum (VI) and Oxovanadium (IV) with Cycloheptanecarbohydroxamic Acid (CPHA) and their Therapeutic Effect on Some Microorganisms

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(received April 1, 2011; revised October 23, 2011; accepted November 27, 2011)

Abstract. Cycloheptanecarbohydroxamic acid (CPHA) was synthesized, characterized and their pka determined spectrophotometrically as 9.70 at 25 °C and in buffers of 0.1 mol/dm³ ionic strength (*I*). The spectroscopic investigation of its reaction with Mo (VI) and VO (IV) in aqueous solution revealed the sole formation of 1:6 and 1:2 complexes at equilibrium. The isolated complexes were characterized by elemental analysis, molar conductance, magnetic moments, IR and electronic spectra studies. The magnetic and spectra studies of the isolated complexes indicate coordination via oxygen atom of the hydroxamate group. The interactions of both the ligand and its isolated complexes with some microorganisms have been studied. Both the ligand and its complexes show significant sensitivity towards the microbes and also, the related complexes can enhance antibacterial activity.

Keywords: ionic strength, square pyramidal coordination, molar conductance, molybdenum, oxovanadium, hydroxamic acid, antibacterial activity

Improved Modeling for Pressure Drop in Microtubes

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Abstract. The study was carried to predict the pressure drop in the microtubes by applying a finite volume solver. The full Navier-Stoke's approach is examined for this kind of narrow tubes for the pressure drop evaluations. The complete form of the energy equation with the dissipation terms is also linked to the momentum equations. The computed pressure drop show good agreements with the experimental data. The effects of flow rate and channel geometry on the pressure drop of the system are also predicted.

Keywords: microtubes, pressure drop, finite volume method, aspect ratio

Optimization of Coagulation Process for the Treatment of the Characterized Slaughterhouse Wastewater

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(received October 10, 2010; revised March 5, 2011; accepted April 30, 2011)

Abstract. The wastewater of a slaughterhouse was characterized for parameters like pH, COD, BOD, TDS and TSS. All parameters were above the permissible limits of National Environmental Quality Standards of Pakistan. The slaughterhouse wastewater is rich in organic matter with BOD and COD being 5820 mg/L and 6970 mg/L, respectively. In this study, wastewater was treated by coagulation process using lime and alum (both individually and in combination) as coagulants. COD removal increased with increase in alum dose to a maximum of 92%. The high sludge volume made the process infeasible. Increase in lime dose increased the COD reduction to a maximum of 74%. The sludge settling speed was very high and sludge volume was low as compared with alum. The combined doses of lime and alum gave removal of COD to a maximum of 85% with sludge volume comparable to lime. The optimum dose of lime and alum reduced BOD, TSS, and TDS to a maximum of 85%, 98% and 77%, respectively. The combination of coagulation/precipitation gave enhanced COD removal with minimal sludge produced.

Keywords: slaughterhouse, wastewater, coagulation, alum, lime, sludge volume

Metal Contents in the Ground Waters of Tharparkar District, Sindh, Pakistan, with Special Focus on Arsenic

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(received March 22, 2011; revised August 17, 2011; accepted August 25, 2011)

Abstract. An integrated study was carried out to assess the ground water quality of Thar Desert, with exclusive focus on arsenic contamination, as ground water is the main source of drinking water in that area. Overall ninety nine (99) water samples were randomly collected from thirty three (33) different locations of District Tharparkar and surveyed for arsenic (As) and other metals of potential concern in drinking water samples like iron (Fe), calcium (Ca), copper (Cu) and zinc (Zn). Ground water samples of two villages namely, Murid Khan Umarani and Khan Khanjar Reham have been found contaminated with As concentration present above 10 ppb while in the rest of the samples, As concentration is within the maximum permissible limit of all existing standards and has been found within narrow variations. This high profile of As in ground water is due to geochemical deposition of As in the vicinity. The quality of 76% of samples have been found to be extremely deteriorated due to the presence of high dissolved solids and hardness, making water unfit for drinking purposes.

Keywords: arsenic, ground water pollution, metal contents, Tharparkar

Short Communication

Chemical Evaluation and Treatment of Ground Water for University Town Peshawar, Pakistan by Reverse Osmosis Technology

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(received September 9, 2010; revised September 30, 2011; accepted October 10, 2011)

Abstract. Present study is focused on the ground water treatment for the University Town Peshawar by reverse osmosis technology, based on the principle of reverse-osmosis pure water and ultra pure water filtration. Water collected from three locations was analyzed. The results showed that the first two water samples were neutral having pH 7.09 and 7.16 comparable with the range (6.50-8.50), while the pH for the water sample getting purified and passed from RO process was 5.33 i.e. slightly acidic. The ionic content of the water sample was low, whereas the conductivity ranged from 624-634 μ S/cm for the first two samples and reduced to 1.37 μ S/cm. The parameters investigated are below the safety baseline levels of the national and international standards with the exception of Pb.

Keywords: water analysis, filtration, reverse osmosis
