# ASSESSMENT STATUS REPORT OF UTD

Name of the School: School of Chemical Sciences

Year of Report: 2012-2013

Part A: The plan of action chalked out by the IQAC in the beginning of the year towards quality enhancement and the outcome achieved by the end of the year.

IQAC conceived of infusing further rigour in execution of all academic programmes so that students are encouraged to face challenges in emerging careers in chemical sciences. To meet this objective, brain storming sessions were held. It was decided to hold the expert lectures from time to time. Sound planning of the course work for Ph.D was undertaken and need based as well as effective syllabi of Research Methodology and Computer Applications were designed.

The outcome was encouraging and one student Ms.Sarabjot Kaur Makkad was able to achieve All India Rank 7<sup>th</sup> in the CSIR-UGC NET and was offered **Shyama Prasad Mukherjee (SPM) fellowship**. Besides, Ms.Pallavi Gupta has also qualified NET and obtained 13<sup>th</sup> rank.

#### Part B:

1.	Activities reflecting the goals and objectives of the institution	To explore new horizons of knowledge in chemical sciences and to blend it effectively in academic curricula for overall educational purpose.  To fulfill these goals and objectives, we have undertaken following activities.  Rigorous teaching with teaching aids. Strong emphasis on research activities.  Encouragement to the students to undertake challenging assignments. Seminar presentation by students.
2.	New academic programmes initiated	Ph.D. course work
3.	Innovations in curricular design and transaction	Emphasis on conceptual learning
4.	Inter-disciplinary programmes started	In all M.Sc. programmes interdisciplinary papers such as Mathematics for Chemists, Biology for Chemists, Computer Applications, Bioorganic Chemistry, Bioinorganic Chemistry and Environmental Chemistry have been included.
5.	Examination reforms implemented	Semester system is followed in its true spirit. Answer sheets are shown to the students after evaluation.

6.	Candidates qualified NET/SLET/GATE etc.	of students selected through NET / GATE: NET = 03; GATE: 02			
		Mr.Pankaj Bariya (NET-2012) Ms.Sarabjot Kaur(NET-2013),AIR 7 <sup>th</sup> ,Awarded SPM fellowship Ms.Pallavi Gupta(NET-2013), AIR 13 <sup>th</sup> Mr.Pramod Gavel (GATE-2012) Mr.Kuber Singh Rawat(GATE-2012)			
7.	Initiative towards faculty development programme	<ol> <li>Dr. A. V. Bajaj participated in NME-ICT program (SAKSHAM) in association with Microsoft on June 10, 2013 to June 20, 2013.</li> <li>Dr. Pratibha Sharma attended a Workshop at IIT, Indore on February 22-23, 2013.</li> <li>Faculty members of the School are doing collaborative research with national institutes and various international universities.</li> </ol>			
8.	Total number of seminars / Lectures/workshops organized	School organized a lecture on March 4, 2013 on the occasion of National Safety Day in the department. Prof. R. M. Choukse delivered his lecture on "Safety Measures".			
9.	Research projects a)Newly implemented: b)Completed:	See Annexure I Ongoing: 05 Completed: 06			
10.	Patents generated if any	Nil			
11.	New collaborative research programmes	See Annexure II			
12.	Research grants received from various agencies	See Annexure I			
13.	Details of research scholars	Students with fellowships : 04 Students without fellowship : 17			
14.	Citation index of faculty members and impact factor	See list of publications of faculty members with impact factor. See Annexure III			
15.	Honors/Awards to the faculty	<ul> <li>Prof. Ashok Kumar (in Faculty category )and Mr. Pankaj Patidar (in Student Category) have been awarded by "Best Science Research Award of MPCST in 2012"</li> </ul>			
16.	Internal resources generated	Departmental Fees			

17.	Details of departments getting SAP, COSIST (ASSIST) / DST.FIST, etc. assistance/recognition	Rs. 30 lakhs as FIST support from DST		
18.	Community services	Faculty, students and non teaching staff participated in plantation activities		
19.	Teachers and officers newly recruited	One (Contractual)		
20.	Teaching-Non-teaching staff ratio	Ratio: 1:2 (11: 19)( as per sanctioned posts)		
21.	Improvements in the library services	New books with latest titles have been added in the Library.		
22.	New books/journals subscribed and their value	Procurement of various standard books has been done from time to time and facility of various International Journals has been provided for all faculty members and Research scholars through Science Direct.		
23.	Courses in which student assessment of teachers is introduced and the action taken on student feedback	Student's feedback was analyzed. Overall rating of the faculty members was very good.		
24.	Unit cost of education  Unit Cost = Total annual expenditure budget ( Actual) divided by the number of students enrolled	About Rs. 1.15 Lakh per student		
25.	Computerization of administration and the process of admissions and examination results, issue of certificates	<ul> <li>All the results of the semester examination grade sheets are prepared on the computer.</li> <li>All day to day letters, Dept profiles, data asked from the University are prepared on the computer.</li> </ul>		
26.	Increase in the infrastructural facilities	FTIR and UV-Vis spectrophotometer were optimally utilized.		
27.	Technology up gradation	Networking facility through IT center has been provided to facilitate teaching and research.		
28.	Computer and internet access and training to teachers and students	Yes		
29.	Financial aid to students	Scholarship to SC/ST students is provided by state Government for M.Sc students.		
30.	Activities and support from the Alumni Association	Alumni help the students to find opportunities of research and jobs.		

31.	Activities and support from the Parent Teacher Association	Informal meetings with parent of students to help in career path identification.			
32.	Health services	Students are provided health centre facility by the University.			
33.	Performance in sports activities	Students participated in the sports activity organized by UTD sports association.			
34.	Incentives to outstanding Sports persons	None			
35.	Student achievements and awards	<ul> <li>Mr. Pankaj Patidar has been awarded by "Best Science Research Award of MPCST in 2012"</li> <li>Mr. Sunil Patidar and Mr. Dileep Singh Sisodiya won the award in Quiz competition organized by MPCST in 2012.</li> <li>Ms Sarabjot Kaur awarded prestigious Shyama Prasad Mukherjee (SPM) fellowship owing to her 7th All India Rank in NET Exam.2013</li> </ul>			
36.	Activities of the Guidance and Counseling unit	Faculty members guide the students from time to time on various issues including research opportunities and preparation for NET/ GATE exam.  Mentors have been appointed for a group of 20 students.  Mentors are appointed to look after the students problems.  Faculty members for different courses are as follows:  Mentor  Course  Dr. A. V. Bajaj  M. Sc. Chemistry (1st sem.)  Dr. A. Kumar  M. Sc. Appl. Chemistry (1st sem.)  Dr. H.P.S. Chauhan  M. Sc. Pharma. Cemistry (1st sem.)  Dr. Pratibha Sharma  M. Sc. Chemistry (3rd sem.)  Dr. S. Khare  M. Sc. Applied Chemistry (3rd sem.)  Dr. Sheela Joshi  M. Sc. Pharma. Chemistry (3rd sem.)			
37.	Placement services provided to students	Faculty members guide the students for job opportunities in academic Institutions and Industries.			
38.	Development programmes for non-teaching staff	Informal guidance for upgradtion of computer skills.			
39.	Healthy practices of the institution	<ul> <li>Regular and quality teaching</li> <li>Active participation in research activity</li> </ul>			
40.	Linkages developed with National/International, Academic/Research bodies	See Annexure II			
41.	Any other relevant information the institution wishes to add	School's mission is to provide high quality education and training for high flying careers in Chemical Sciences. Our distinguishing features are:  • Theoretical and practical knowledge of Instrumental			

	<ul> <li>Techniques.</li> <li>Interpretation of various types of spectra. Nuclear Magnetic Resonance (NMR) Electron Spin Resonance (ESR), Infrared (IR), Ultraviolet-Visible (UV-Visible), Mössbauer, Mass Spectrometry.</li> <li>The strength of the School has been and continues to be excellence in research and teaching.</li> <li>The faculty is extremely well qualified and motivated with a strong commitment to research.</li> </ul>
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### (PART - C)

## Detail the plans of the institution for the next year:

Yearly plan: 2013 -2014

#### Curriculum

- It is planned to increase the diversity in spectral interpretation w.r.t. new examples and relevant patterns.
- It is planned to revise syllabus to meet contemporary requirements. Restructuring of the curriculum will be done with a focus to introduce Physicoorganic Chemistry and Nanomaterial Chemistry in the M.Sc.course and LASER chemistry in Ph.D course work syllabi.
- To develop prudent approach in the students taking NET and similar quality oriented competitive examinations

### **Strategies of Teaching Learning**

- Use of teaching aids to be encouraged and novel methods of learning such as quiz to be adopted as and when applicable.
- Students will be encouraged to develop their soft skills and communication skills.

## **Student Feedback System Design**

Students' feedback about the School, faculty members and the curriculum would be practiced as per IQAC design.

### Collection of Feedback and its Analysis: Format of Analysis

Feedback will be collected by Dec 2013 and May 2014 and will be analyzed by faculty members.

The overall report will be prepared and necessary improvements will be done for coming year.

# **Improvement Plan**

### Infrastructure

New building for School of Chemical Sciences needs to be constructed on high priority basis.

## **Research Activities and Promotion**

- Faculty members would be encouraged to participate in seminars and conferences
- Collaborative research activities will be promoted.

Name and Signature of the Coordinator QAC

Name and Signature of the HEAD

Annexure I

Details of research grant received from different agencies during the last five years: 20082013

Name of the Investigator	Title of the project and duration	Status	Amount sanctioned	Funding agency
Dr. R. Prasad	Surface and catalytic studies of nanocrystalline and nanoporous metal oxides.	Completed	Rs.3,06,000/-	CSR-UGC- DAE
	Studies of few catalytic vapour phase alkylation and cyclization reactions.	Completed	Rs. 7,64,800/-	UGC, New Delhi
Dr. Ashok Kumar	Synergistic extraction and spectrophotometric determination of toxic metal ions and lanthanides at trace level by chromogenic substituted calix(n) arenes.	Completed	Rs. 10,46,000/-	CSIR, New Delhi
	Synergistic extraction and stripping voltammetric determination of toxic metal ions and lanthanides at trace level.	Completed	Rs. 17,00,000/-	DST, New Delhi
Dr.H.P.S. Chauhan	Synthetic, Spectroscopic, Thermal and Biochemical Studies on some Group 14 (Si, Ge and Sn) and Group 15 (As, Sb and Bi) Metal and Organometallic Complexes with some sulphur and/or Oxygen Donor Organic Ligands.	Completed	Rs.4,11,100/-	UGC, New Delhi
Dr.Pratibha Sharma	Design, Synthesis, Electrochemical Studies and Evaluation of Therapeutic Potential of Purines and Benzimadazoles Through Quantitative Structure - Activity Relationship	Completed	Rs.17,20,000/-	DRDO,New Delhi
Dr. R. Prasad	Quantum Mechanical and Molecular Mechanics Computation of few molecules, Reactions and	Ongoing	Rs. 4,94,000/-	MPCST, Bhopal

	Nano materials.			
Dr.H.P.S. Chauhan	Group 15 Metal and Organometallic Derivatives with Mixed Sulphur and/or Oxygen Donor Ligands: Synthesis and Characterization: Thermal and Biochemical Studies	Ongoing	Rs. 8,04,800/-	UGC, New Delhi
Dr.H.P.S. Chauhan	Studies on the synthesis and characterization of some group 15 Metal nano complexes with Sulfur donar ligands.	Ongoing	Rs. 7,83,000/-	MPCST, Bhopal.
Dr. KK Pandey	Structure and bonding analysis of ylidine complexes Ln-M=E-R(M=Cr, Mo, W; E=Si Ge, Sn Pb; R=Cp,MeS): A DFT study	Ongoing	Rs. 5,95,000/-	CSIR, UGC
Dr. Ashok Kumar	Efficient Construction of Novel Triazole as Potential Therapeutics : A Classical Versus Click Chemistry Approach	Ongoing	Rs. 44,84,000/-	DRDO ,New Delhi

### **International Collaboration of the Professors:**

## Dr. K.K. Pandey

### Collaborative Research work with European and American Scientists

- (1) Prof. G. Frenking
  Faculty of Chemistry,
  University of Marburg,
  Germany
- (2) Prof. Phillip P. Power Department of Chemistry University of California Davis USA
- (3) Prof. Agusti Lledos Department of Chemistry, University of Autonoma Barcelona, Spain
- (4) Prof. F. Maserus Institute of Chemical Research of Cataonia (ICIQ), Tarragona, Spain
- (5) Dr. D. G. Musaev Director Emerson Centre for Scientific Computation, Emory University, USA
- (6) Prof. D. C. Liotta Editor: J. Medicine Chem. Letters (American Chemical Society, USA) Department of Chemistry, Emory University, USA
- (7) Prof. Simon Aldridge Department of Chemistry, Oxford University, UK
- (8) Prof. Holger Braunschweig Department of Chemistry, University of Wurzburg, Germany

(9) Prof. Cameron Jones School of Chemistry Monash University, Australia

**Annexure III** 

# SCHOOL OF CHEMICAL SCIENCES DEVI AHILYA UNIVERSITY INDORE

## List of Publications with Impact factors (2008-2013):

No. of Publication during 2008-13 in international journals = 104.

1. Stretched  $\sigma$ -borane complexes of rhodium: A theoretical study

K.K. Pandey

Inorg. Chem. Commun. 11 (2008) 288

Impact Factor: 1.972

2. σ-Borane complexes of nickel, palladium and platinum. A theoretical study

K.K. Pandey

J. Mol. Struct. (THEOCHEM) 855 (2008) 18

Impact Factor: 1.288

3. Mixed-ligand Ru(II) complexes with 2,2'-bipyridine and tetradentate Schiff bases ligands: Synthesis, physico-chemical study, DFT analysis, electrochemical and Na binding properties

L. Mishra, R. Prajapati, K.K. Pandey

Spectrochimica Acta (A): Molecular and Bimolecular Spectroscoscopy 70 (2008) 79-85.

Impact Factor: 1.952

4. Transition Metal sigma-borane complexes

K.K. Pandey

Coord. Chem. Revs. 253 (2009) 37

Impact Factor: 12.110

5. Linear M≡E-Me Versus Bent M-E-Me: Bonding Analysis in Heavier Metal- ylidyne Complexes [(Cp)(CO)<sub>2</sub>M≡EMe] and Metallo-ylidenes [(Cp)(CO)<sub>3</sub>M-EMe] (M = Cr, Mo, W; E = Si, Ge, Sn, Pb)

Krishna K. Pandev and Agustí Lledós

Inorg. Chem. 48 (2009) 2748-2759.

Impact Factor: 4.601

6. The Nature of M-B Versus M=B Bonds in Cationic Terminal Borylene Complexes: Structure and Energy Analysis in the Borylene Complexes  $[(\eta^5-C_5H_5)(CO)_2M\{B(\eta^5-C_5Me_5)\}]^+$ ,  $[(\eta^5-C_5H_5)(CO)_2M(BMes)]^+$ , and  $[(\eta^5-C_5H_5)(CO)_2M(BNMe_2)]^+$  (M = Fe, Ru, Os)

Krishna K. Pandey, Agusti Lledos and Feliu Maseras

Organometallics 28 (2009) 6442-6449.

Impact Factor: 3.963

7. Structure and Bonding Energy Analysis of Cobalt, Rhodium and Iridium Borylene Complexes  $[(\eta^5-C_5H_5)(CO)M(BNX_2)]$  (X = Me, SiH<sub>3</sub>, SiMe<sub>3</sub>) and  $[(\eta^5-C_5H_5)(CO)M(BNX_2)]$  (Y = Me, SiH<sub>3</sub>, SiMe<sub>3</sub>) (Y = Me, SiH<sub>3</sub>) (Y = Me, S

 $C_5H_5$ )(PMe<sub>3</sub>)M{BN(SiH<sub>3</sub>)<sub>2</sub>)] (M = Co, Rh, Ir)

Krishna K. Pandey and Djamaladdin G. Musaev

Organometallics 29 (2010) 142-148.

Impact Factor: 3.963

8. Linear versus bent bonding in metal-phosphinidene complexes: Theoretical studies of the electrophilic phosphinidene complexes  $[(\eta^5-C_5H_5)(CO)_2M(PMe)]^+, [(\eta^5-C_5H_5)(CO)_2M(PMe)]^+]$ 

 $C_5H_5)(CO)_3M(PMe)^{+}$  (M = Cr, Mo, W)

Krishna K. Pandey and Agusti Lledos

J. Organomet. Chem. 695 (2010) 206-214.

Impact Factor: 2.384

9. Computational Studies of Transition Metal Selectivity of Octapeptide Repeat Region of Prion Protein (PrP)

Krishna K. Pandey, James P. Snyder, Dennis C. Liotta and Djamaladdin G. Musaev J. Phys. Chem. A 114 (2010) 1127-1135.

Impact Factor: 2.946

10. New ruthenium(II) thiolato complexes: Synthesis, reactivity, spectral, structural and DFT studies

Sudhakar D. Dwivedi, Santosh K. Dubey, Ashish K. Singh, Krishna K. Pandey and Daya S. Pandey

Inorg. Chim. Acta 363 (2010) 2095-2103.

Impact Factor: 1.846

11. Structure and Bonding Energy Analysis of M-Ga Bonds in Dihalogallyl Complexes Trans- $[X(PMe_3)_2M(GaX_2)]$  (M = Ni, Pd, Pt; X = Cl, Br, I)

Krishna K. Pandey, Pankaj Patidar, Holger Braunschweig

Inorg. Chem. 49 (2010) 6994-7000.

Impact Factor: 4.601

12. Nature of M-Ga Bonds in Dihalogallyl Complexes  $(\eta^5-C_5H_5)(Me_3P)_2M(GaX_2)$  (M = Fe, Ru, Os) and  $(\eta^5-C_5H_5)(OC)_2M(GaX_2)$  (X = Cl, Br, I): A DFT Study

Krishna K. Pandey, Pankaj Patidar, Simon Aldridge

J. Phys. Chem. A 114, 2010, 12099-12105.

Impact Factor: 2.946

13. Nature of Bonding in Terminal Borylene, Alylene and Gallylene complexes of Vanadium and Niobium [(η<sup>5</sup>-C<sub>5</sub>H<sub>5</sub>)(CO)<sub>3</sub>M(ENR<sub>2</sub>)] (M = V, Nb; E = B, Al, Ga; R = CH<sub>3</sub>, SiH<sub>3</sub>, CMe<sub>3</sub>, SiMe<sub>3</sub>): A DFT Study Krishna K. Pandey, Holger Braunschweig, Agusti. Lledós

Inorg. Chem. 50 (2011) 1402-1410.

Impact Factor: 4.601

14. DFT Study on the Alkylborylene and Haloborylene Complexes of Manganese and Rhenium: Structure and Bonding Energy Analysis in  $[(\eta^5-C_5H_5)(CO)_2M(BR)]$  and  $[(\eta^5-C_5H_5)(CO)_2M(BX)]$  (M = Mn, Re; R = Me, Et, iPr, tBu; X = F, Cl, Br, I) Krishna K. Pandey, Holger Braunschweig, Rian D. Dewhurst

Krisilia K. Fandey, Holger Braunschweig, Klaii D. Dewhul

Eur. J. Inorg. Chem. 2011, 2045-2056

Impact Factor: 3.049

15. Unexpected Generation of Diastereomers by Double Diboration of a Dialkyne F. Bauer, H. Braunschweig, K. Gruß, Christoph Lambert, Krishna K. Pandey, K. Radacki, D. Reitzenstein

Chem.Eur.J.17(2011)5230-5233.

Impact Factor: 5.925

16. Nature of M-Ga Bonds in Cationic Metal-Gallylene Complexes of Iron, Ruthenium and Osmium [(η<sup>5</sup>-C<sub>5</sub>H<sub>5</sub>)(L)<sub>2</sub>M(GaX)]<sup>+</sup>. A Theoretical Study Krishna K. Pandey, Simon Aldridge

Mishia K. Fandey, Simon Aldridge

Inorg. Chem. 50 (2011) 1798-1807.

Impact Factor: 4.601

17. Nature of M-Bi bonds in dihalobismuth complexes of nickel, palladium and platinum trans- $[X(PMe_3)M(BiX_2)]$  (M = Ni, Pd, Pt; X = Cl, Br, I)

Krishna K. Pandey

Comput. Theoret. Chem. 967 (2011) 140-146.

Impact Factor: 1.288

18. Nature of M-E bonds in metallosilylenes, germylenes, stannylenes and plumbylenes  $[(\eta^5 - C_5H_5)(Me_3P)(H)_2M(EPh)]$  (M = Fe, Ru, Os; E = Si, Ge, Sn, Pb)

Krishna K. Pandey, Philip P. Power

Organometallics 30 (2011) 3353-3361

Impact Factor: 3.963

19. Structure and bonding energy analysis of cationic metal-ylyne complexes of molybdenum and tungsten [(MeCN)(PMe<sub>3</sub>)<sub>4</sub>M≡EMes]<sup>+</sup> ( M = Mo, W; E = Si, Ge, Sn, Pb): A Theoretical Study

Krishna K. Pandey, Pankaj Patidar, Philip P. Power

Inorg. Chem. 50 (2011) 7080-7089. Impact Factor: 4.601

20. Structure and bonding analysis of dimethylgallyl complexes of iron, ruthenium and osmium  $[(\eta^5-C_5H_5)(CO)_2M(GaMe_2)]$  and  $[(\eta^5-C_5H_5)(Me_3P)_2M(GaMe_2)]$  Krishna K. Pandey

J. Phys. Chem. A 115 (2011) 8578-8585.

Impact Factor: 2.946

21. Structure and bonding in haloarylgallyl complexes of iron, ruthenium and osmium

 $[(\eta^5-C_5H_5)(CO)_2M\{Ga(X)(Ph)\}]$ : A theoretical study

Krishna K. Pandey, Pankaj Patidar

J. Organomet. Chem. 696 (2011) 3536-3542.

Impact Factor: 2.384

22. Bis(borylene) Complexes of Cobalt, Rhodium, and Iridium [(η<sup>5</sup>-C<sub>5</sub>H<sub>5</sub>)M(BNX<sub>2</sub>)<sub>2</sub>]

 $(X = Me, SiH_3, SiMe_3)$ : A Bonding Analysis

Krishna K. Pandey

Organometallics 30 (2011) 5851-5858

Impact Factor: 3.963

23. Structure and bonding analysis of dihalogallyl and dimethylgallyl complexes of molybdenum and tungsten  $[(\eta^5-C_5H_5)(CO)_3M(GaX_2)]$  (M = Mo, W; X = Cl, Br, I, Me): A Theoretical Study Krishna K. Pandey

Comput. Theoret. Chem. 973 (2011) 13-19.

Impact Factor: 1.288

24. The nature of M-Ga in metal(I) gallyl complexes of copper, silver and gold: A

Theoretical study

Krishna K. Pandey

J. Organomet. Chem. 701 (2012) 75-79

Impact Factor: 2.384

25. Theoretical investigation of M≡E bonds in transition metaleylidyne complexes trans-[H(PMe<sub>3</sub>)<sub>4</sub>M≡ER] (M = Mo, W; E = Si, Ge, Sn, Pb; R = Mes, Xylyl) Krishna K. Pandey, Pankaj Patidar

I O 7 702 (2012) 50 (

J. Organomet. Chem. 702 (2012) 59-66

Impact Factor: 2.384

26. Structure and bonding analysis in dihalobismuth complexes of iron, ruthenium and osmium  $[(\eta^5-C_5H_5)(CO)_2M(BiX_2)]$ : A theoretical Study

Krishna K. Pandey, Pankaj Patidar, Pradeep Tiwari

Polyhedron 34 (2012) 84-91.

Impact Factor: 2.057

27. What is the best bonding model of the  $(\sigma\text{-H-BR})$  species bound to a transition metal: Bonding analysis in complexes  $[(H)_2Cl(PMe_3)_2M(\sigma\text{-H-BR})]$  [(M = Fe, Ru, Os)]

Krishna K. Pandey

Dalton Trans. 41 (2012) 3278-3286.

Impact Factor: 3.840

28. Structure and bonding analysis of dimethylgallyl complexes of cobalt, rhodium and Iridium [Me(PMe<sub>3</sub>)<sub>2</sub>(Me<sub>3</sub>GaCl)M(GaMe<sub>2</sub>)] (M = Co, Rh, Ir) and

[Me(PMe<sub>3</sub>)<sub>2</sub>ClIr(GaMe<sub>2</sub>)] : A theoretical study

Krishna K. Pandey

J. Organomet. Chem. 710 (2012) 6-11.

Impact Factor: 2.384

29. Theoretical investigation of triple bond in molybdenum complexes trans-

 $[X(PMe_3)_4Mo\equiv E(Mes)]$  (X = F, Cl, Br, I; E = Si, Ge, Sn, Pb): A DFT study

Krishna K. Pandey, Pankaj Patidar

Polyhedron 37 (2012) 85-93.

Impact Factor: 2.057

30. A theoretical study of the bonding and charge distribution in cationic group 8 metal borylene and alylene complexes: Consequences for complex stability and reactivity

Krishna K. Pandey

Polyhedron, 43 (2012) 131-139.

Impact Factor: 2.057

31. The Nature of Mo $\equiv$ E Bonds: Structure and Bonding Analysis of the Molybdenum-Ylidyne Complexes Trans-[ $X(dmpe)_2Mo\equiv E(\eta^1-C_5H_5)$ ] (E = Si, Ge, Sn, Pb; X = H, Cl, Br, I, CN) Krishna K. Pandey, Pankaj Patidar, Alexander C. Filippou

Inorg. Chem. 2012 Accepted.

Impact Factor: 4.601

32. Bonding energy analysis in cationic borylene complexes of palladium and platinum: A theoretical study

Krishna. K. Pandey

Polyhedron 52 (2013) 1431-1439.

Impact Factor: 2.057

33. Nature of M-( $\eta^2$ -H-SiR<sub>2</sub>) in chromium, molybdenum and tungsten complexes [( $\eta^2$ -C<sub>5</sub>H<sub>5</sub>)(dmpe)M( $\eta^2$ -H-SiR<sub>2</sub>)] and [( $\eta^2$ -C<sub>5</sub>H<sub>5</sub>)(CO)<sub>2</sub>M( $\eta^2$ -H-SiR<sub>2</sub>)]: A theoretical study Krishna K. Pandey

Polyhedron 55(2013) 241-248

Impact Factor: 2.057

34. Nature of M–Ge Bonds in the Metallogermylene Complexes of Chromium, Molybdenum, and Tungsten  $[(\eta^5-C_5H_5)(CO)_3M\{GeN(SiMe_3)R\}]$  and  $[(\eta^5-C_5H_5)(CO)_3M\{GeN(Ph)R\}]$  (R = Ph,

Mesityl (Mes)): A Theoretical Study

Krishna K. Pandey and Cameron Jones

Organometallics 32 (2013) 3395-3403

Impact Factor: 3.963

35. Bonding analysis of the neutral electrophilic phosphinidene complexes of vanadium and niobium  $[(\eta^5-C_5H_5)(CO)_3M(PNR_2)]$  (R = Me,  $^iPr$ ,  $^tBu$ ): A DFT study

Krishna K. Pandey, Pradeep Tiwari, Pankaj Patidar

J. Organomet. Chem. 740 (2013) 135-140.

Impact Factor: 2.384

36. Accurate theoretical description of the M-PNR<sub>2</sub> bonds in phosphinidene complexes of manganese and rhenium [(CO)<sub>5</sub>M-PNR<sub>2</sub>]<sup>+</sup> (R = Me, <sup>i</sup>Pr, <sup>t</sup>Bu) and [(PMe<sub>3</sub>)(CO)<sub>4</sub>M-PN<sup>i</sup>Pr<sub>2</sub>]<sup>+</sup>: A DFT-D3 study

Krishna K. Pandey, Pradeep Tiwari, Pankaj Patidar, Sunil K. Patidar, Ravi Vishwakarma and Pankaj K. Bariya

J. Organomet. Chem., (2013) In Press

Impact Factor: 2.384

37. A DFT assisted mechanism evolution of the Carbonylation of Ethylene glycol to ethylene carbonate by urea over Zn (NCO)<sub>2</sub>.(NH<sub>3</sub>)<sub>2</sub> catalyst

Prabhakar Sharma, Reena Dwivedi, Rajiv Dixit and Rajendra Prasad

Ind. Eng. Chem. Res. (2013) DOI 10.1021/ie400745x

Impact Factor: 2.206

38. Microwave-Assisted Synthesis of Mixed Metal-Oxide Nanoparticles

Akrati Verma, Reena Dwivedi, R. Prasad, and K. S. Bartwal

Journal of Nanoparticles (2013), Article ID 737831,

Impact Factor: 1.546

39. Synthesis of ethylene carbonate from cyclocondensation of ethylene glycol and urea over ZnO.Cr<sub>2</sub>O<sub>3</sub>catalyst system controlled by co-precipitation method.

Sheenu Bhadauria, Samidha Sexana, Rajandra Prasad, Prabhakar Sharma, Reena Dwivedi.

European J Chem., 3, (2012) 235

Impact Factor: 0.746

40. Microwave assisted synthesis of tetragonal nanocrystalline zirconia Nanoparticles

Reena Dwivedi, Anjali Maurya, R Prasad and K S Bartwal

Journal of Alloys and Compounds, 509 (2011) 6848–6851.

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