



# IIP

# NEWSLETTER

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No. 2

## REPUBLIC DAY CELEBRATIONS



Dr T S R Prasada Rao hoisted the National Flag in the premises of the institute. This was followed by a ceremonial march past by the security guards and patriotic action songs by the children of the IIP Colony School. Before concluding the function Dr Prasada Rao addressed the gathering and exhorted the employees to take a pledge to serve the country with dedication.

## MESSAGE

Today we are celebrating the 42nd Republic Day and on this happy occasion I greet you and your families.

The nation's economy is under strain because of the Gulf war and the coming years can be extremely difficult. Under these conditions we must take a vow to rise to the occasion and do our best. There is also a greater need to practice austerity. In future, the role of our institute will be more important in view of the shortage of crude and petroleum products. Our contribution did receive recognition last year when it bagged the first CSIR Technology Award for developing and commercialising 'Aromatic Extraction Technology'. Another achievement was 'Development of Bimetallic Reforming Catalyst' in collaboration with Indian Petrochemicals Corporation Limited and its commercialisation by two public sector undertakings. In other areas such as additives and alternative fuels also IIP is doing commendable work. Our institute should strive to achieve a higher level of excellence in the years to come. For this we have to develop a culture of team spirit, hard work, discipline and greater interaction with the industry. In this effort I seek your help so that this institute can play its important role more effectively in serving the economy of the country.

January 26, 1991

Dr T S R Prasada Rao

## NATIONAL SCIENCE DAY

February 28, 1991, the National Science Day was observed at the institute to commemorate Nobel Laureate **Sir C V Raman's** great contributions to science especially the 'Raman Effect'. The highlight of the event was a lecture entitled 'Status of scientific research in India' by the Chief Guest, **Dr S C Bhattacharyya**, Honorary Visiting Professor, Indian Institute of Technology (IIT), Bombay, who had worked with Sir C V Raman for about ten years while at the Indian Institute of Science, Bangalore. In his welcome address, **Dr T S R Prasada Rao**, expressed his happiness in having an eminent scientist like Dr Bhattacharyya to grace the occasion.

Introducing Professor Bhattacharyya to the gathering, **Dr G C Joshi**, Deputy Director, IIP, gave a brief account of his brilliant academic career and achievements acclaimed not only in the country but abroad as well.

Dr Bhattacharyya in his lecture, expressed his happiness that he has been closely associated with CSIR,

an organisation that has done much more to science compared to any other organisation in the country. Having gone round and seen the laboratories, he felt happy that IIP is also doing good work.

Reminiscing on his association with science for over five decades, Dr Bhattacharyya eulogised the role of Raman and his contributions to science. He pointed out that very few people know that Raman's discovery known as 'Raman Effect' was made mostly as a part-time worker when he was Deputy Accountant General. "The research work he did without any remuneration and facilities. Without grumbling he did the work with locally fabricated equipment. The zeal and enthusiasm overshadowed various hurdles of high magnitude because of his total dedication and identification with science. He is the only Indian scientist to get the Nobel prize for work done in India, that too at a very young age of 42. Raman is a glowing and glorious example to be remembered by everyone," he said.

On behalf of the staff of IIP, Dr Prasada Rao presented a shawl as a memento to Dr Bhattacharyya as a symbolic gesture of admiration and

appreciation. Dr Prasada Rao said that he saluted the wisdom of those who made February 28, the day 'Raman Effect' was discovered, as National Science Day. "This serves to get inspiration and develop a scientific temper which are necessary to advancement of science in the country," he said.

As part of the programme, to encourage young minds, about 200 students from different schools of Dehradun were given demonstrations in modelling and simulation by **Dr Alok Saxena**, **Mr Srikant Nanoti** and their group of Computer Simulation and Modelling Cell. ■

## CONFERENCE BRIEFS

### ● Workshop on Catalyst Design

**Dr T S R Prasada Rao** participated in the Workshop on Catalyst Design held at Trieste, Italy, during December 11-13, 1990 at the invitation of the International Centre for Science and High Technology (UNIDO). This workshop was organised by the International Centre for Pure and Applied Chemistry (The Third World Academy of Sciences) in cooperation with the International Centre for Theoretical Physics and chaired by **Professor C N R Rao**, Director, Indian Institute of Science, Bangalore. Dr Prasada Rao also presented a paper titled 'Design, development and commercialisation of zeolite-based catalyst for xylene isomerisation'. He also visited Department of Industrial Chemistry and Materials, Bologna, Italy. ■

### ● National Symposium on Catalysis and Indo-Soviet Seminar on Catalysis

The 10th National Symposium on Catalysis and the 4th Indo-Soviet Seminar on Catalysis were held at the Indian Institute of Technology (IIT), Madras, during December 18-21, 1990 under the auspices of the Catalysis Society of India. **Dr T S R**



*Professor S C Bhattacharyya delivering lecture on National Science Day. On left is Dr G C Joshi, Deputy Director and Head, Organic Chemistry Division, IIP.*

**Prasada Rao** is the Secretary of the Society. About 300 delegates from research organisations, universities, public sector undertakings and IITs in the country, and from abroad especially USSR, USA, Germany and Japan participated. The delegation from the Soviet Union was the largest and consisted of about 16 eminent scientists. More than 100 research papers related to various aspects under catalysis were presented in the oral and poster sessions. There were 11 plenary lectures by experts in the field. Besides Dr Prasada Rao, a team of four scientists, **Mr R P Mehrotra**, **Mr G N Kulshreshtha**, **Dr J S Bawa** and **Dr L D Sharma** represented the institute. The scientists also had fruitful interaction on topics of mutual interest with the Russian delegates and other participants.

### INDO-SOVIET PROGRAMME (Catalysis)

After **Dr T S R Prasada Rao** took over as Area Coordinator of the Integrated Long Term Programme (ILTP) in the area of catalysis, the first project review meeting was held under his chairmanship at IIP on March 15, 1991. The meeting was attended by **Dr A P Kulshreshtha**, Joint Advisor, Department of Science and Technology; **Dr A B Halgeri**, Manager (R&D) Indian Petrochemicals Corporation Limited, Baroda; **Professor B Viswanathan**, Indian Institute of Technology, Madras, and some senior scientists from National Laboratories viz **Dr V R Choudhary**, **Dr B S Rao** and **Dr J C Sehra**, National Chemical Laboratory, Pune; **Dr P Kanta Rao**, Indian Institute of Chemical Technology, Hyderabad; and **Dr S B Halligudi**, Central Salt and Marine Chemicals Research Institute, Bhavnagar. Besides concerned scientists from the institute, **Mr S P Mishra**, Under Secretary (Finance), DST, also participated in the meeting. The participating scientists presented the progress of their respective projects.

### TRIBOLOGY SILVER JUBILEE

Tribology Silver Jubilee was celebrated at the Indian Institute of Petroleum on March 12, 1991. This was jointly organised by Tribological Society of India (TSI) and IIP. In the function, majority of the participants was from the institute. Other organisations such as Oil and Natural Gas Commission, Bharat Heavy Electricals, Reliance Industries, Hindustan Petroleum Corporation etc. were also well represented in the function.

**Mr Sudhir Singhal**, Deputy Director, welcomed the gathering and briefly spoke about the impor-

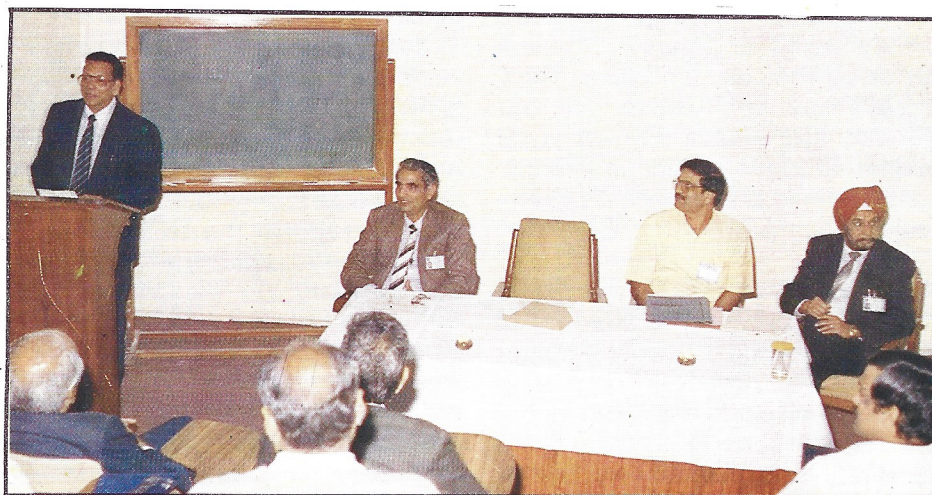
tance of Tribology and the work being done at the institute. This was followed by several talks on 'Plasto-hydrodynamic lubrication' by **Mr B M Shukla**, 'National strategy on lubricant conservation' by **Mr S Singhal**, 'TSI and its activities' by **Dr P C Nautiyal**, 'A report on IXth NCIT' by **Dr V R K Sastry**, and initiation of a discussion on 'Possible applications of Tribology in the rural sector' by **Dr R P S Bisht**.

**Dr T S R Prasada Rao** and **Mr N K Srivastava**, Director (Refineries), HPCL, also spoke on the occasion highlighting the importance of Tribology.

### TRAINING PROGRAMME FOR ENGINEERS FROM RELIANCE INDUSTRIES LTD

A ten day orientation programme on Petroleum Refining and Petrochemicals Technology was organised by the institute, for Chemical Engineers and some senior staff members from Reliance Industries Limited (RIL), Bombay, from March 12-22, 1991. The course was inaugurated by **Mr N K Srivastava**, Director (Refineries), Hindustan Petroleum Corporation Limited (HPCL), Bombay.

**Mr Vishnu Kekatpure**, representative of RIL, briefly spoke on the operations of his company. **Dr T S R Prasada Rao**, Director, had earlier welcomed the guests and **Dr Himmat Singh**, Head, Training Division, briefed the participants about the training programme. The course was completed on March 22, 1991 with a brief valedictory function.



*Mr N K Srivastava, Director (Refineries) HPCL, inaugurating the course. Seated from left to right are Dr Prasada Rao, Director, IIP, Mr Vishnu Kekatpure of RIL and Dr Himmat Singh, Head, Training Division, IIP.*

# Emission Control and Fuel Economy - Are These Conflicting Requirements?

B P Pundir and Sudhakar Das

## ABOUT THE AUTHORS



**Dr B P Pundir**  
M S (Mech), Ph D

Joined the institute in 1968. Presently, Project Coordinator at the Engines Laboratory. Specific areas of research interest are engine fuels, combustion and emissions. Has published 70 papers in international and national journals and conferences. Visited several research laboratories in the USA, Europe and Japan. Represents the institute on several BIS committees and is a Member of SAE, USA.



**Sudhakar Das**  
B Sc Engg (Mech), M E

Joined the institute in 1981. Presently working as Engineer at the Engines Laboratory. Research areas include internal combustion engine performance, emission and air pollution studies, and mathematical modelling of in-cylinder air motion. 13 publications in the above mentioned areas. Visited NRCC, Ottawa under UNIDO Programme. Also awarded BOYSCAST Fellowship 1990-91 from Ministry of Science and Technology, Govt. of India. Represents the institute on BIS Committee on Automotive Engine Emissions.

## INTRODUCTION

Conservation of energy and environment are important issues in the present times. India being a net importer of petroleum crude, fuel conservation has to be accorded the utmost priority particularly in the road transport sector as almost 56% of total petroleum products are consumed in this sector. On the other hand, due to a high growth in vehicle production, particularly scooters, mopeds and passenger cars in the last few years, the large cities are already facing air pollution problem caused by vehicular emissions. Thus, it becomes imperative for our economy that solutions which would result both in the reduction in emissions and fuel consumption of vehicles are sought for.

## EMISSION INVENTORY

The environmental loading of CO, HC, NO<sub>x</sub> and particulate matter pollutants in the country due to vehicular emissions estimated for the year 1989 is approx. 15.2, 6.3, 5.6 and 1.3 lakh tonnes, respectively. By the year 2000 if no emission controls are in force, emissions of each pollutant will increase by a factor of 2 to 2.5 times and to restrict vehicular air

pollution even to the present levels, almost 50 to 60 percent reduction in total emission of each pollutant is required. However, as a large fraction of uncontrolled vehicles in service at present would continue to operate even in the year 2000, emission standards requiring even more than 60 percent reduction will be necessary to maintain the present level of total vehicular pollution.

## EMISSION CONTROL TECHNOLOGIES AND FUEL ECONOMY

Moderate to large reductions in vehicle emissions have been possible by those technologies which also result in the improvement of vehicle fuel economy. Stringent controls and more so relating to the nitrogen oxides, require the technologies which may result in poor fuel economy.

### Four-Stroke Gasoline Vehicles-Passenger Cars

The first exhaust emission standards in the US and till recently in Europe have been met primarily through the following techniques:

- \* Leaner mixture operation,
- \* Improved design and calibration of carburetors,

- \* Idle mixture adjustments and faster idle speed,
- \* Improved spark timing control and use of electronic ignition system, and
- \* Reduction in quench zones in combustion chamber etc.

In Europe, 50 to 60 percent reduction in CO and HC and about 20-30 percent reduction in NO<sub>x</sub> have resulted through the above improvements. The design modifications in intake manifold to improve mixture preparation and reduce the maldistribution amongst different engine cylinders and use of high turbulence combustion chamber have made it possible to run the engine much leaner than before.

The average air-fuel ratio used in cars in Europe increased from 13.6:1 during 1970s to 16:1 in 1980s. This leaner operation of the cars, resulted in 10 to 11% better fuel economy and along with substantial reductions in CO and HC. With improvement in combustion chamber design, the mixture can be further leaned to obtain reduction in all the three pollutants as well as the fuel consumption.

Emission control technologies,

e.g. exhaust gas recirculation (EGR), exhaust gas treatment by catalytic reactors are required to obtain emission reductions of more than 75%. However, these do not provide direct fuel economy benefits excepting those resulting from electronically controlled engine and fuel system required to be adopted when using 3-way catalysts. Use of EGR, in fact, deteriorates the fuel efficiency.

A modern, emission controlled, 4-stroke gasoline engine requires various computer controlled subsystems which are listed below:

- High energy ignition (HEI)
- Exhaust gas recirculation (EGR)
- Positive crankcase ventilation system (PCV)
- 3-way catalyst evaporative emission canister
- Multi-port fuel injection

#### **Two-Stroke Gasoline Engine Powered Two and Three Wheelers**

Two and three wheelers in India are mostly powered by the two stroke engine due to simplicity of its design, low cost, high power-to-weight ratio and ease of maintenance. An inherent drawback of the conventional design is short-circuiting of 15 to 40% of fresh fuel-air mixture directly to the exhaust resulting in very high hydrocarbon emissions and poor engine efficiency. More than 65% of total vehicular hydrocarbon emissions are estimated to emanate from these vehicles in the country.

The conventional two-stroke engines cannot be run very lean as the high amount of residual gases in the combustion chamber reduces the speed of flame propagation. Improvements in the carburettor design, ignition system and optimization of port design and timing etc. provide only small reductions in the unburned hydrocarbon emissions.

IIP has developed a two stroke engine with a novel intake system consisting of two parallel intake circuits. The additional circuit supplies air alone to the transfer passages through non-return valve(s). It reduces mixture short circuiting as the

scavenging is preferentially done with air alone. It is a relatively low cost modification to the engine. Reductions upto 40% in HC and fuel efficiency improvement of 10-12% have been obtained in the laboratory prototype. Engine prototypes, employing in-cylinder fuel injection thus eliminating short circuiting of fuel-air mixture as the scavenging is carried out by air only, have been developed by several researchers world over. Their adoption to 2-wheelers is still under development. These engines have a high potential for fuel economy improvement as well as reduction in unburned hydrocarbons.

Catalytic oxidation of exhaust CO and HC in the two-stroke engine apart from many problems related to its design and adaptability to two wheelers and cost will provide no fuel economy benefits as the combustion of unburned fuel in the exhaust gives no useful work.

An alternative power plant for two and three wheelers is the small 4-stroke engine. Typical data for 4-stroke engine powered motorcycles show only 1/10th HC emissions and 40 to 50% better customer fuel economy compared to those powered by the 2-stroke engines.

#### **Diesel Vehicles**

The diesel vehicles operate with large amounts of excess air resulting in rather low CO and HC emissions. Particulates, smoke and nitrogen oxides are the principal pollutants to be controlled. The control strategy becomes complicated as reduction in one emission results in increase of another, when  $\text{NO}_x$  and particulates are concerned.

In the diesel engines, injection process, spray development and fuel-air mixing control the combustion process and pollutant formation. It may be said that to a large extent solution to the problem of emission reduction lies within the diesel engine itself.

The turbocharging has provided reductions in the diesel engine emissions along with fuel economy benefits.

Turbocharging has resulted in 8 to 15% lower emissions and 5 to 7% improvement in fuel economy. Turbocharging provides substantial benefits on smoke also as the same power output can be obtained from low fuelling rates resulting in low smoke emissions. The particulate traps being developed to meet very stringent US emission standards, however, could cause small losses in fuel economy.

Modern emission control techniques for diesel engines are given below:

- Turbocharging with intercooling/charge air cooling
- Variable injection timing limiter
- Puff limiter
- Fast response turbocharger
- Reduced fuel sulphur to 0.5%
- Reduced lube oil consumption
- Reduced fuel aromatics, 10% maximum
- Electronically controlled injection
- Computer control of feed back sensors on turbochargers, injection system (closed loop)
- Particulate traps

#### **CONCLUSIONS**

##### **Passenger Cars:**

- \* Medium level reductions in CO and HC and fuel economy improvements are in correspondence with each other.
- \* High  $\text{NO}_x$  reductions alongwith CO and HC (3-Way catalyst, EGR, spark retard) compromises fuel economy as engine compression ratio is to be reduced to operate on unleaded gasoline.

##### **Two-Stroke Engines**

- \* Reduction in HC and higher fuel economy are obtained simultaneously if achieved through engine improvements or use of alternative power plants.

##### **Diesel Engines**

- \* Reduction in CO, HC and PM and higher fuel efficiency are compatible.
- \* For  $\text{NO}_x$  reduction (injection retard) and fuel economy a trade-off is to be exercised. ■

## HONOURS, AWARDS AND RECOGNITION

**Dr T S R Prasada Rao** has been nominated as the Area Coordinator (catalysis) for India in the Integrated Long Term Programme (ILTP). This programme was chalked out by the scientific delegation from India led by **Prof C N R Rao**, Chairman, Scientific Advisory Council to the Prime Minister, and the Soviet delegation in 1987. This was as a follow-up of the agreement reached during the summit meetings between the then Prime Minister of India **Shri Rajiv Gandhi** and the General Secretary of the CPSU Central Committee **Mr M S Gorbachev** to strengthen cooperation in science and technology between the two countries. Dr Prasada Rao succeeds **Dr Paul Ratnasamy** of National Chemical Laboratory, Pune, as the Area Coordinator.

**Mr V S Saini** won the best presentation award for the paper titled 'Studies on microbial dewaxing of petroleum fractions' by V S Saini, V R Sista (both of the Indian Institute of Petroleum) and N M Surana, N Subrahmanyam (both of M S University, Vadodara) in the Indian Chemical Engineering Congress held during December 18-21, 1990 at the Banaras Hindu University, Varanasi.

**Mr Basant Kumar, Mr H C Chandola, Dr R B Gupta and Dr Pradeep Kumar** won a cash award of Rs. 250 besides a certificate of merit for their paper titled 'Characterisation of heavy alkylated benzenes by GC-MS technique' adjudged for the first place in the Poster Session of Fifth National Symposium on Mass Spectrometry organised by the Indian Society for Mass Spectrometry during January 7-9, 1991 at the Physical Research Laboratory, Ahmedabad.

**Dr Himmat Singh** chaired a session on Specialty Products in the 7th LAWSPSP symposium held in January 1991 at IIT Bombay.

**Dr K M Agrawal and Dr G C Joshi's** paper titled 'Structural investigation on waxes' published in *Erdoel und Kohle-Erdgas - Petrochemie* 43, 6: 239 (June 1990) has been included in API Abstracts by the American Petroleum Institute.

**Dr K M Agrawal and Dr H U Khan** became fellow members of Indian Council of Chemists for the year 1991.

**Dr S P Srivastava** was approved as Supervisor for Ph D Thesis (Physics) by the Meerut University.

**Dr T S R Prasada Rao** has been nominated as a Member of the Governing Body of the LPG Equipment Research Centre, Bangalore.

**Mr P N Bhambi** has been nominated as Chairman of Sectional Committee on Commercial and Domestic LPG Appliances of the Bureau of Indian Standards.

**Mr U C Agrawal** was invited as an expert for examination of M.Sc. Engineering first semester students in the Chemical Engineering and Petroleum Studies Institute of Aligarh Muslim University in March 1991. ■

## LECTURES DELIVERED

**Dr A N Goswami**

- 'Liquid membranes' in the Workshop on New Challenges in Separation Processes at the Jawaharlal Nehru Centre for Advanced Scientific Research, Bangalore, during December 13-16, 1990.

**Dr T S R Prasada Rao**

- 'Zeolites as catalysts in organic synthesis' at the University Department of Chemical Technology (UDCT), Bombay, on February 14, 1991.
- 'Innovations in catalysis - Indian scenario' at the Indian Institute

of Chemical Engineers at Ahmedabad on February 16, 1991.

- 'Zeolites and their promise in petrochemical industries' at the Department of Chemical Engineering, University of Roorkee, on March 8, 1991.
- 'Innovation in catalysis' in the Monitoring Workshop on Thrust Areas in Physical Chemistry organised by the Department of Science and Technology at the Goa University on March 19, 1991. ■

## DISTINGUISHED VISITORS

**Professor Devendra Lal**, presently Professor at the Geological Research Division, Scripps Institution of Oceanography, University of California, San Diego, USA, and former Director of Physical Research Laboratory, Ahmedabad, visited the institute during December 15-19, 1990 at the invitation of DG, CSIR and had detailed discussions with senior scientists on various research activities of the institute.

**Dr S C Gray**, Research Member Chemical Coordination Group, Unilever, London, visited IIP on January 10, 1991 alongwith **Dr A N Gandhi**, Head, Chemical Group, Hindustan Lever Limited, Bombay. Dr Gray gave a talk on the 'Organisational set up of Unilever, London'.

**Dr M T Rahman**, Professor of Organic Chemistry, Dhaka University, Bangla Desh, visited the institute at the invitation of the Director, IIP, and had discussions with senior scientists on topics of mutual interest and also delivered a colloquium 'The magnesium-based cuprates in organic synthesis' on January 16, 1991.

**Professor B W Wojciechowski**, Department of Chemical Engineering, Queens University, Kingston, Canada, visited the institute from January 31 to February 3, 1991. He

had discussions with scientists on catalytic processes and gave a colloquium on 'Effect of gas oil composition on cracking'.

**Professor S M Csicsery**, UNIDO Consultant, Chemical Sciences and Technology, visited the institute from February 11-13, 1991. During his visit he had discussions with scientists working in the areas of catalysis and conversion processes on zeolites and its application in catalysis. He also gave colloquia on 'Shape selective catalysis in zeolites' and 'How to test and how not to test catalysts' on February 11 and 13, 1991 respectively.

**Professor S C Bhattacharyya**, Honorary Visiting Professor, IIT, Bombay, delivered colloquia on 'Naturally occurring musks - an interesting group of compounds' and 'Essential oils, fragrance and flavours' on March 5 and 7, 1991, respectively.

## DEPUTATIONS

### Abroad

**Dr A K Saxena** and **Mr S K Jain**, Senior Engineers have undergone practical training on process design at Institute Francais du Petrole, France, from July-December 1990.

### India

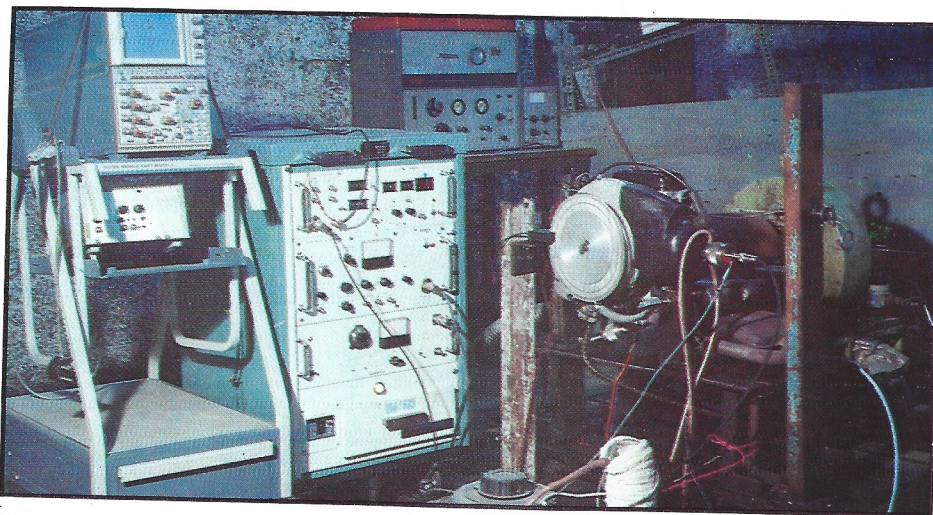
**Mr K A Qureishi**, Senior Stores & Purchase Officer, attended a training programme in 'Management in Government' organised by the Department of Personnel and Training, during December 31, 1990 to January 11, 1991 at the Administrative Training Institute, Mysore.

**Dr B S Rawat**, Head, Separation Processes Division, attended a course on Management of R & D Systems, during February 18-23, 1991 at the Administrative Staff College of India, Hyderabad.

## MAJOR RESEARCH FACILITY COMMISSIONED

A set-up for high speed sampling of in-cylinder gas of I.C. engines was commissioned. This set-up comprises of a high speed sampling valve, its control and sample collection units. This facility can be used for measurement of scavenging parameters

such as trapping efficiency, scavenging efficiency etc. of two-stroke engines and also composition of combustion gas of any I.C. engine for studies related to combustion and its kinetics.



Set-up for high speed sampling of in-cylinder gas in IC engines.

## KNOW-HOW RELEASED

High capacity IIP film burner to M/s Encon Thermal Engineering, Faridabad.

## PATENT FILED

Patent Prov. file No. 1175/DEL/90 dated 27.11.90

*An improved process for the preparation of FDA grade micro crystalline waxes*

J S Bahl, Himmat Singh, Umesh Gupta and Deepak Tandon.

## PUBLICATION AVAILABLE FOR SALE

**Handbook of Crude Oils**  
(Two volumes) 1990

A ready reference book of crude evaluation data on all major Indian crudes and foreign crudes processed in Indian refineries.

Cost Negotiable

**SAVE OIL -**



**TO KEEP THE WHEELS OF PROGRESS ON THE MOVE**

## भारतीय पेट्रोलियम संस्थान में गणतंत्र दिवस समारोह

भारतीय पेट्रोलियम संस्थान के निदेशक डॉ टी एस आर प्रसाद राव ने ४२वें गणतंत्र दिवस समारोह के अवसर पर संस्थान के परिसर में ध्वजारोहण किया। इस अवसर पर सुरक्षा गार्डों ने विधिवत मार्च-पास्ट किया एवं "आई आई पी कॉलोनी स्कूल" के बच्चों ने देश-भक्ति के गीत गाये। तदुपरान्त निदेशक महोदय ने संक्षिप्त भाषण दिया।

निदेशक महोदय ने सर्वश्री नरेन्द्र सिंह रमोला, सुरक्षा अधिकारी एवं कनिष्ठ सुरक्षाकर्मी, श्री श्याम लाल-१ को अपने कर्तव्य के प्रति अनुकरणीय उदाहरण के लिए प्रशस्ति पत्र प्रदान किए। साथ ही श्री श्याम लाल-१ को उनकी कर्तव्यनिष्ठा के लिए ३०० रुपये का नक़द मानदेय भी प्रदान किया गया।



श्री श्याम लाल प्रशस्ति पत्र प्राप्त करते हुए, दायीं और श्री हनुमन्त लाल, प्रशासन निबंधक खड़े हैं।

## आई आई पी कॉलोनी स्कूल खेल-दिवस

आई आई पी कॉलोनी स्कूल ने १२ जनवरी १९९१ को खेल-कूद दिवस का आयोजन किया जिसमें नर्सरी से छठी कक्षा तक के बच्चों ने विभिन्न प्रतियोगिताओं में भाग लिया तथा पी टी का अत्याकर्षक प्रदर्शन किया। डॉ टी एस आर प्रसाद राव, निदेशक ने बच्चों, अध्यापिकाओं तथा उपस्थित जनसमूह को सम्बोधित किया तथा श्रीमती प्रसाद राव ने पुरस्कार वितरण किया।



श्रीमती प्रसाद राव द्वारा बच्चों को पुरस्कार वितरण।

## होली मिलन

आई आई पी स्टाफ क्लब द्वारा सामुदायिक केन्द्र में पहली बार २८ फरवरी १९९१ को होलिका-दहन का आयोजन किया गया व अगले दिन होली-मिलन का मनमोहक कार्यक्रम भी आयोजित किया गया। इस अवसर पर सर्वश्री सुनील शर्मा, हरबंस सिंह सेवक, डॉ महेन्द्र पाल एवं प्रेम प्रकाश मणी

द्वारा संगीत प्रस्तुत किया गया। निदेशक महोदय द्वारा सर्वश्री शर्मा व मणी को पुरस्कृत किया गया।



"होली है"

## कार्मिक समाचार

### • स्वागत है

श्री महेन्द्र पाल सिंहल, प्रशासन अधिकारी, फरवरी ११, १९९१

श्री भरत सिंह रावत, वित्त एवं लेखा अधिकारी, फरवरी २६, १९९१

### • पदोन्नति पर बधाई

अनुभाग अधिकारी, श्री विशेश्वर नाथ, अप्रैल १, १९९०

वरिष्ठ आशुलिपिक, सुश्री गीता क्षेत्री, फरवरी २२, १९९१ एवं

श्री आर सुवामण्यम, फरवरी २२, १९९१

### • सहायक

श्री श्रीराम मेहरा एवं श्री ओम प्रकाश धाम, अप्रैल १, १९९०

### • उच्च श्रेणी लिपिक

श्री राजा राम एवं श्री कैलाश चन्द्र पालीवाल, अप्रैल १, १९९०

### • पुरस्कार

#### हिन्दी लेखन प्रतियोगिता

श्री मनमोहन कुमार, उ.श्रे. लि. को वर्ष १९८९-९० के लिये हिन्दी लेखन प्रतियोगिता का प्रथम पुरस्कार निदेशक, आई.आई.पी. द्वारा दिया गया।

पुरस्कार स्वरूप उन्हें ५०० रुपये का नक़द भुगतान भी किया गया।

### • सेवा-निवृत्ति पर शुभकामनायें

श्री जगन नाथ, कनिष्ठ सुरक्षागार्ड, दिसम्बर ३१, १९९०

श्री लाल सिंह, वरिष्ठ यांत्रिक सहायक, दिसम्बर ३१, १९९०

श्री साधू राम गेंदा, वित्त एवं लेखा अधिकारी, फरवरी १, १९९१

### • स्थानान्तरण पर शुभकामनायें

श्री तारिक कुतबुद्दीन, प्रशासन अधिकारी, फरवरी ११, १९९१

प्रशिक्षण कक्ष, सी एस आई आर, नई दिल्ली

श्री पदम प्रकाश गर्ग, सहायक, फरवरी २७, १९९१

केन्द्रीय भवन अनुसंधान संस्थान, रुड़की

असामायिक निधन पर हार्दिक शोक

श्री कन्हैया लाल, हैल्पर, जनवरी ४, १९९१

श्री संत राम, तकनीशियन, फरवरी १३, १९९१