

MET.TEL

NEWSLETTER



METALLURGY DEPARTMENT
DR. S. & S. S. GHANDHY COLLEGE OF ENGINEERING &
TECHNOLOGY, SURAT

JULY 2018

1st

MATERIALS EDITION

ABOUT METALLURGY DEPARTMENT



In 1965, Metallurgy Department was established in Dr. S. & S. S. Ghandhy College of Engineering and Technology, Surat, South Gujarat. This is the only institute that offers diploma metallurgy program in Gujarat. Institute is governed by Department of Technical Education, Government of Gujarat. Diploma metallurgy program is approved by All India council for technical education (AICTE), New Delhi and is affiliated to Gujarat Technological University, Ahmedabad. Metallurgy department strives hard in order to fulfil the growing global demands of skilled human resource in the field of metals.

FROM HOD'S DESK

Warm Greetings to all!

Diploma metallurgy engineering department aim to bring out

We are pleased to bring you this 1st edition of newsletter. The newsletter shall be reflection of departmental activities related to students, staff members and technological trends in metallurgical field.

Hope you all enjoy reading it.

- **Mrs. B. H. Goyal**
(HOD Metallurgy)

STAFF MEMBERS



Mrs. B. H. Goyal (HOD)
ME-Industrial Metallurgy



Mr. S. F. Parmar (LME)
ME- Material Technology



Ms. S. M. Patel (LME)
ME-Material Technology
PhD (Pursuing)



Mr. T. K. Kyada (LME)
ME-Industrial Metallurgy



Mr. R. D. Dave (LME)
ME-Welding Technology



Mr. N. G. Patel (LME)
ME-Industrial Metallurgy



Mr. A. M. Gautam (LME)
ME-Material Technology



Ms. J. B. Lad (Lab. Asst.)
Diploma Mechanical



FACULTY DEVELOPMENT PROGRAM

- **Mr. S. F. Parmar** has attended training on “Strategic leadership and innovation in a changing environment” during 26/06/2017 to 30/06/2017 at NITTTR, Bhopal.
- **Ms. S. M. Patel** has attended training on “Developing Entrepreneurship Skills in Students” during 26/06/2017 to 30/06/2017 at NITTTR, Ahmedabad.

FACULTY ACHIEVEMENT

- **Ms. S. M. Patel** has co-authored 01 **book** entitled **Mineral Processing: (Including Mineral dressing, Experiments and numerical)**. This book is published by I. K. International Publishing House Pvt. Ltd., on 2017. ISBN No, of this book is 978-9-385-90950-4.
- **Mr. S. F. Parmar** presented a paper entitled “**Study the effect of zinc and nickel on Al-5Mg alloy**” in “International conference Recent Advances in Metallurgy for Sustainable Development” on 1st to 3rd February 2018 at Faculty of Tech. & Engg., The M. S. University of Baroda.
- **Ms. S. M. Patel** presented a paper entitled “**Study the Influence of MnO₂ and MnCl₂ on Microstructure and Mechanical Properties of Pure Magnesium**” in “International conference Recent Advances in Metallurgy for Sustainable Development” on 1st to 3rd February 2018 at Faculty of Tech. & Engg., The M. S. University of Baroda. The paper is also published in conference proceeding. ISBN No. is 978-93-88879-64-4. She has also published 2 papers entitle “**Study the Influence of Bismuth and Zinc on Microstructure and other Properties of Magnesium**” and “**Electroplating of Nickel and Chromium on Aluminium 6082-T6 Alloy**” in same proceeding.



GLIMPSES OF “EXPERT LECTURES”

- **Prof. A. B. Lele & Dr. S. K. Datta** (Prof. and HOD, Metallurgy Engg., MSU) delivered expert lecture on *“How to success in your life”* on 19/01/2017. 34 students have participated in this expert lecture.
- **Mr. Akram Patel** (QA/QC dept., Patel Enterprise, Surat) delivered expert lecture on *“Ultrasonic testing”* on 30/01/2017. 25 students have participated in this expert lecture and learn about the NDT technique.
- **Mr. Hitesh** delivered expert talk on *“Placement opportunity \ in GULF countries for Metallurgy engineering students”* to the final year students on 01/03/2017. 25 students have participated in this expert lecture.



GLIMPSES OF “INDUSTRIAL VISITS”

Electrotherm India Pvt Ltd



- Industrial visit at “**Electrotherm India Pvt. Ltd., Samakhiyali**” was arranged on 10/02/2017 for final year students. Mr. S. F. Parmar, Ms. S. M. Patel, and Ms. U. V. Lad guided the students during the visit. 50 students have visited this company.
- Students learn about blast furnace, pelletizing process, sintering, DI pipes manufacturing processes etc.

TCR Advanced Engineering



- Industrial visit at “**TCR Advanced Engineering, Vadodara**” was arranged on 19/08/2017. Mr. S. F. Parmar and Ms. S. M. Patel, guided the students during the visit. 39 students have visited this company.
- Students learn about various destructive and non-destructive tests.

JMT India Inc.



- Industrial visit at “**JMT India Inc., GIDC Sachin, Surat**” was arranged on 17/02/2018. Mr. S. F. Parmar and Mr. A. M. Gautam guided the students during the visit. 32 students have visited this company.
- Students learn about pattern and core making, mould making, melting practice, casting, testing, finishing of cast products and testing processes.



OTHER ACTIVITIES

The number of co-curricular and extracurricular activities carried out at the institute and departmental level. The details of these activities are:

ACTIVITY NAME	DATE
Tree plantation	20-06-2017
Swachhata Oath	02-08-2017
Orientation programme	03-08-2017
Swachha Bharat Week Celebration	01/09/2017 to 15/09/2017
Law for women empowerment awareness Programme	04-09-2017
Tree plantation celebration by NSS	15-09-2017
Suicide prevention seminar	18-09-2017
Navratri Garba Celebration	29-09-2017
Gayatri Parivaar Yuva Karya rath	03-10-2017
Sardar Vallabhbhai Patel birth anniversary (National Unity Day)	31-10-2017
Constitution Day Celebration	26-11-2017
Mock Group Discussion	20-01-2018
National Voters Day Oath	25-01-2018
Sports week	29/01/2018 to 03/02/2018
Exam conversation with PM (BISAG)	16-02-2018
Wall painting competition (IOCL)	22-02-2018
Thalassemia Test	07-03-2018
Road safety seminar	12-03-2018
Blood donation camp	07-04-2018
YOGA day celebration	21-06-2018



1st Year Orientation program 03/08/2017



Tree Plantation on 20/06/2017

PROJECT OFFERED IN 5TH SEMESTER

GROUP	PROJECT TITLE	ENROLLMENT NO.	STUDENTS NAME	GUIDE NAME
1	Corrosion Protection of Al 6082-T6 Alloy by Ni-Cr Electro-Plating	156120321003	Bhavik Borda	Ms. S. M. Patel
		156120321015	Rahul Gohil	
		156120321017	Fenil Jariwala	
		156120321035	Jayraj Parmar	
		156120321055	Prashant Trivedi	
2	Manufacturing Of High Temperature Fatigue Testing Machine.	156120321032	Paghadal Divyesh A.	Ms. S. M. Patel
		156120321052	Solanki Dinesh A.	
		156120321054	Tailor Meet C.	
		166128321005	Shrivastav Raj M.	
3	Metals For Space Applications	156120321001	Anand Marfatiya	Mrs. B. H. Goyal
		146120321030	Dhaval Kanthariya	
		156120321028	Mehta Bhargav N	
		156120321036	Parth Patel	
4	High Temperature Metals	156120321009	Dhameliya Milan R.	Mr. S. F. Parmar
		156120321029	Nakum Dipak A.	
		156120321040	Patel Kelvin J.	
		166128321004	Raj Mayank R.	
		126120321043	Patel Parth P.	
5	Heat Treatment of Commercial Steel	156120321049	Raval Harsad	Mr. S. F. Parmar
		156120321043	Patel Parth B.	
		166128321002	Junjarao Ravi	
6	Effect of Different Parameters on Welding	156120321031	Olpadiya Krishna	Mr. K. V. Panchal Ms. U. V. Lad Ms. S. M. Patel
		156120321034	Parmar Falguni	
		156120321042	Patel Khyati	
		156120321045	Patel Sweta	
		156120321050	Ravaliya Megha	
		156120321058	Vaishnav Jasmin	
7	Study The Effect of Zinc & Nickel on Al-5Mg	156120321005	Rohit Chavda	Ms. S. M. Patel
		156120321007	Urvik Dandawala	
		156120321008	Jaydip Dangodara	
		156120321021	Vijay Kanani	
		156120321030	Bhavik Narigara	
		156120321053	Keval Solanki	
8	Ultrasonic Flaw Detection – A Non-Destructive testing Technique	156120321042	Patel Mavik P	Mrs. B. H. Goyal
		156120321025	Marathe Rakesh L	
		146120321058	Umakant Mahapatra	
		146120321047	Savaliya Nishant A	
9	Review Secondary Steel Making	156120321016	Hariyani Anshuman R.	Mrs. B. H. Goyal
		156120321011	Dudhatra Keval K	
		156120321014	Gautam Amarbhadur	

INDUSTRIAL TRAINING

Duration: 14 weeks

Sr. No.	INDUSTRY NAME	ADDRESS
1	Nivic Technocast	Rajkot
2	Crown Metal	Katargam, Surat
3	NHB Ball and Bearing	Amalsad, Navsari
4	Jay Metal Tech	Udhna, Surat
5	L&T Heavy Engineering	Hazira, Surat
6	Shiva Foundary	Udhna, Surat
7	Nsvp Induction Casting Pvt Ltd	Udhana, Surat
8	Miranda Tools	Ankleshwar
9	L&T Special Steel and Heavy Forging	Hazira, Surat
10	Vitturia Design Pvt Ltd	Rajkot
11	Inspect NDT Service	Surat
12	Cm Smith & Sons Ltd	Ahmedabad
13	Radianc Technometal	Udhna, Surat
14	M.H.T.E. Metal Heat Treatment	Vallabh Vidhyanagar

STUDENT SPOTLIGHT



Rushil Akbari, Student of Metallurgy Department, Dr. S. & S. S. Gandhi College of Engineering & Technology, Surat secured **1st position** in Gujarat Technological University in 2017.

STUDENT PARTICIPATION IN TECHNICAL EVENT

	Technical event/ conference	Description	Date	Participant's Name
1	"CREATO"	Project: Working model of induction hardening	25 th March 2017	1) Tailor Siddhartha D 2) Kshirsagar Krunal 3) Gupta Rouhan 4) Das Gyanranjan P
2	"CREATO"	Project: Working Model of Colored Anodizing and electrodeposition	25 th March 2017	1) Marfatiya Anand 2) Mehta Bhargav 3) Patel Parth 4) Tailor Meet
3	"International conference on recent advances in metallurgy for sustainable development"	Paper Title: (Presented & Published) Electrolytically plating of Ni,Cr on Al 6082-T6 alloy	1 st to 3 rd February 2018	1) Fenil Jariwala 2) Rahul Gohil 3) Prashant Trivedi 4) Jayraj Parmar 5) Bhavik Borda
4	"International conference on recent advances in metallurgy for sustainable development"	Paper Title: (Presented & Published) Study the influence of Bismuth and Zinc on Microstructure and other properties of Magnesium	1 st to 3 rd February 2018	1) Yash Sonavari

TECHNICAL GALLERY

FAILURE ANALYSIS OF CAST IRON STRAIGHT JOINT OF PIPE FITTING

By

Mr. Fenil Jariwala & Mr. Rahul Gohil



MATERIAL: GRAY CAST IRON PIPE
JOINT

CONDITION: UNDERGROUND BORING
WATER PIPE JOINT

FAILURE TYPE: CORROSION

Abstract:

The failure analysis of a cast-iron pipe joint has been conducted. Corrosion is the main reason of failure of joint of pipes lines and their joints. There are several types of corrosion failure can observed on the joint fitting. In this case study we try to find out the type of corrosion occurs on the joint and analysed the failure of pipe joints and try to give some remedies for these types of failures.

Introduction:

If your home was built prior to 1975 then you most likely have cast iron pipe lines and fittings are used for boring and underground water pumping system in residential area. High-quality cast iron pipe is approved for plumbing and is still used today. The imported cast iron pipes and fitting are used in plumbing due lower cost and high strength.

Before PVC piping became commonplace, the majority of buildings were constructed using these materials. Unfortunately, if this is true for your house, you could be in serious trouble. That's because cast iron pipes have a tendency to be far less reliable than their plastic counterparts. Especially as they get older, they can become weaker and prone to bursting. That can lead to significant issues for homeowners because water damage claims are among the types most frequently denied by insurance companies. With that in mind, it's crucial to know the warning signs of any cast iron pipe problems your property may have.

The worst enemy of cast iron is corrosion. Over time, it can eat away at piping, causing it to crumble or burst under pressure. Generally, pipes jointer (Cast iron elbow, straight connector) are made up of gray cast iron and galvanized. But over a period of time its rusted in soil and salty underground water and cause failure.



Corroded cast iron straight pipe joint



Failure piece of CI joint

Discussion:

The cast iron pipe and fittings failure are primarily associated with the erosion corrosion (internal side) and natural or uniform corrosion (external side). Analysis of failure is done by magnifying glass of 10x magnification.

1) Internal failure: Internal corrosion of the Cast iron fitting occurs due to the high-pressure flow of salty underground water. Also, water contains so many other minerals and elements which favour the high corrosion condition of cast-iron. High pressure water flow in turbulent motion due to the rough surface of inside the joint of pipe (straight joint). This region works as anode site and rusts over time. Pressure of water removes the corrosive product and makes available a new surface exposed to water. And this cycle repeats. This fitting has some definite time life around 15-30 years depending upon the thickness of pipe line and joints. Also, inside the fitting threaded portion works as anodic side for crevice corrosion, which leads to further pits formation and due to this leakage of joints occurs.

2) External corrosion: Generally boring pipes are fitted underground. Soil is the main media of external corrosion. Many properties of soil like pH, moisture, sulphur, bacteria, etc are responsible for external surface corrosion of cast iron pipe and fittings. If pH of soil is less than 4, then highly corrosion of cast iron can occur. Generally uniform corrosion of iron occurs on the surface of fittings. It's as simple as iron corrosion in normal atmosphere.

Crack of joint is mainly occurs due to some stresses can form during the removal of rusted pipes from ground. Pits are main reasons of stress riser and crack formation and also rusted fittings has only oxide product (ferrous hydroxide), which does not have strength to withstand load and stress. Rusted product is very brittle in nature and slight stress can crumble it.

Remedies:

- ✚ Uses cement mortar coating inside and outside of pipe
- ✚ Use leak-tap to seal the crevice
- ✚ PVC pipes are best alternative of cast iron.
- ✚ Apply Galvanized coating on pipes
- ✚ Use protective coating to prevent from corrosion

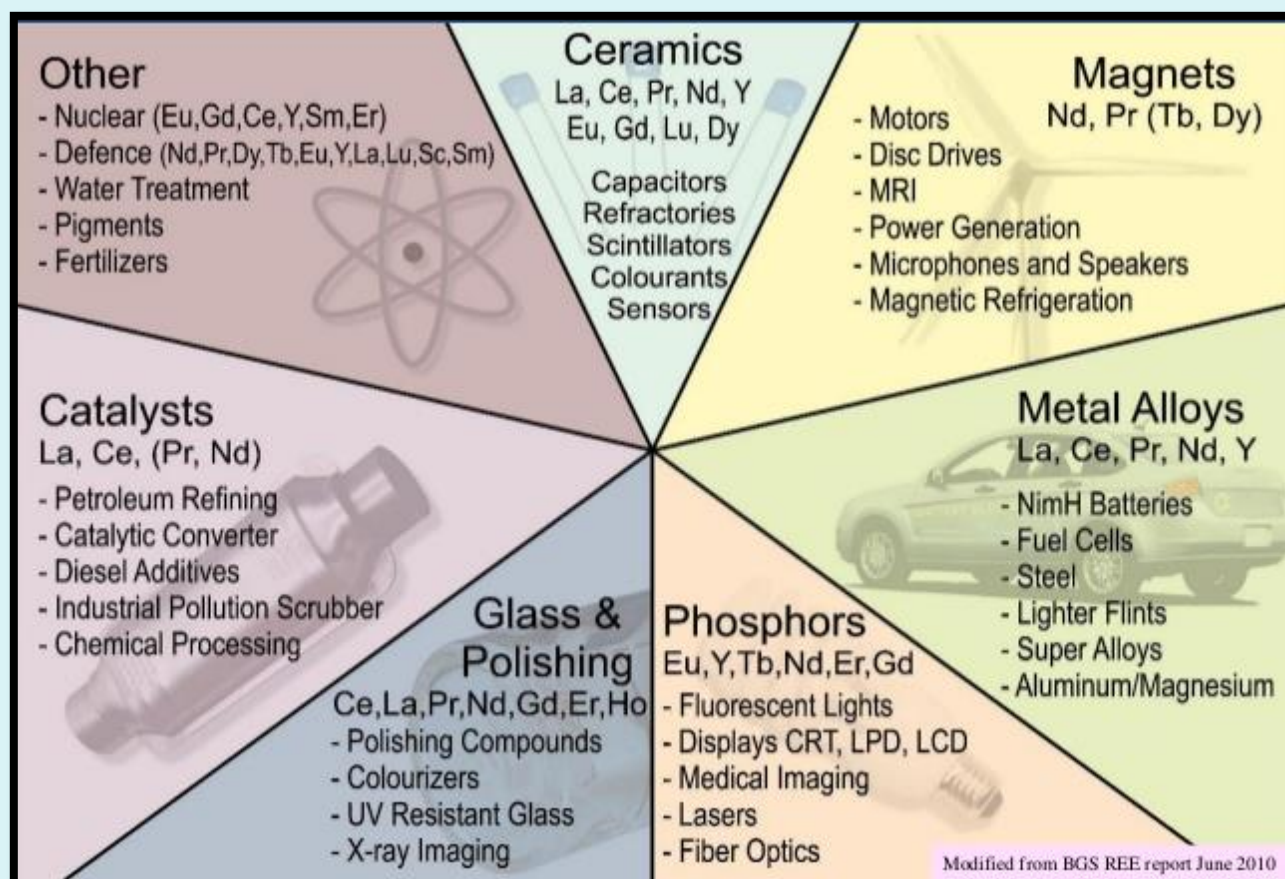
Conclusions:

1. Cast-iron pipes and fittings are most widely used in 19th century due to lower cost, but cast iron has its corrosion resistance property, which is very less and due to this it corrodes to very high rate.
2. Internal corrosion can be done due to erosion corrosion, crevice and pitting corrosion. Pressure of water, properties- chemical composition of water and internal surface condition of pipe and fittings are major factors that's affects the corrosion rate.
Uniform corrosion is done on external surface of pipe. The mainly pH, bacteria, sulphur, etc of the soil mainly affects the corrosion rate.
3. Cracking of upper portion of joint occurs due to application of some stress during the removal of pipes, and corrosion products are brittle in nature, so they cannot withstand the load and its crumbles into small pieces.

Uses and Applications of Rare Earth Elements

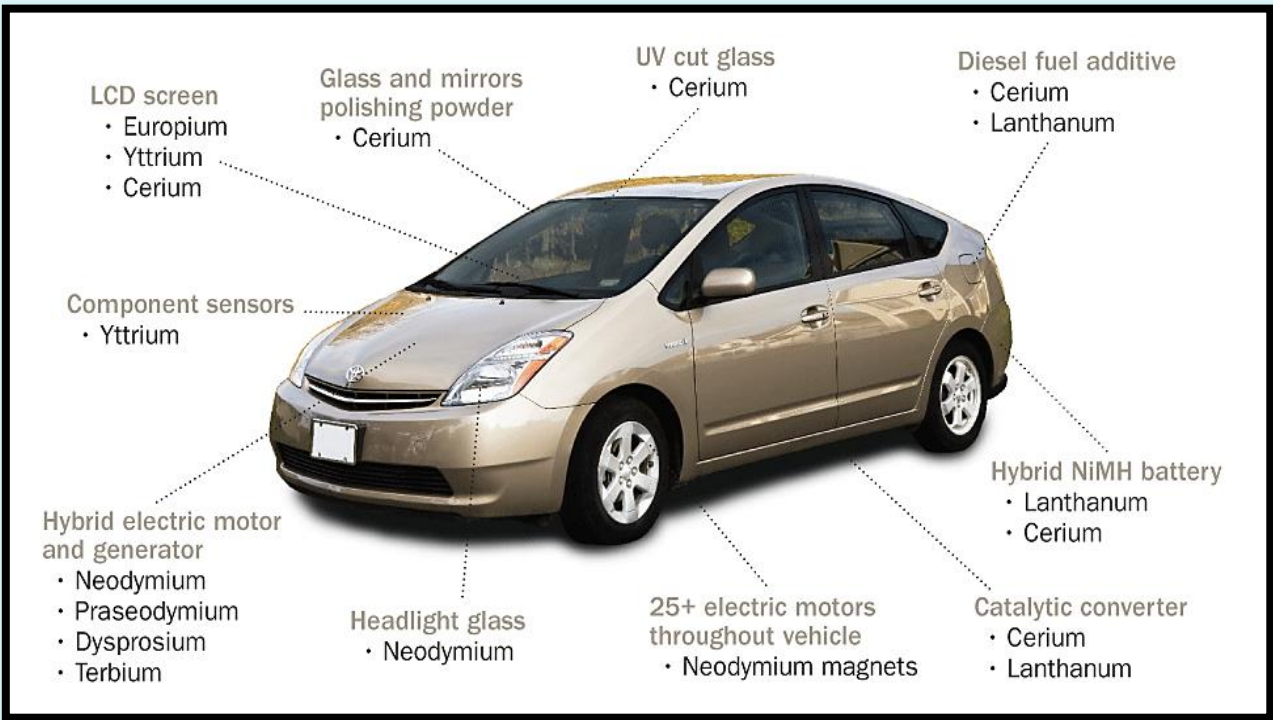
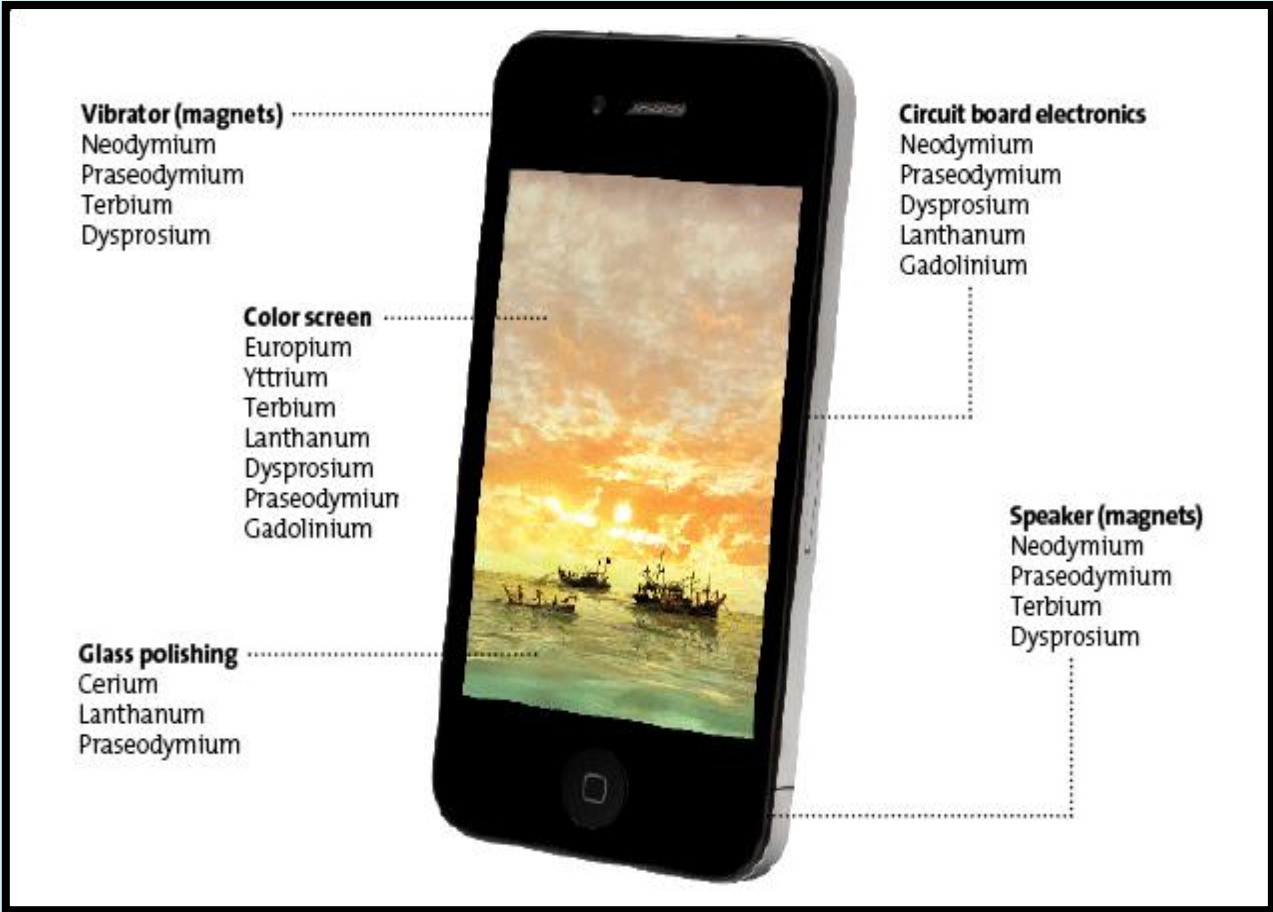
By

Mr. Jayraj Parmar



Uses and applications of rare earth elements

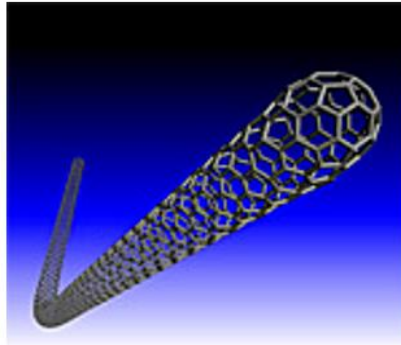
Rare earth metals and alloys that contain them are used in many devices that people use every day such as computer memory, DVDs, rechargeable batteries, cell phones, catalytic converters, magnets, fluorescent lighting and much more.



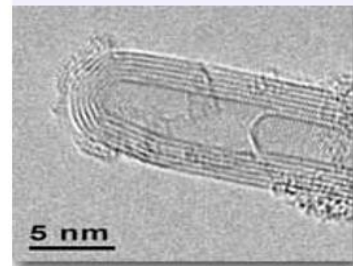
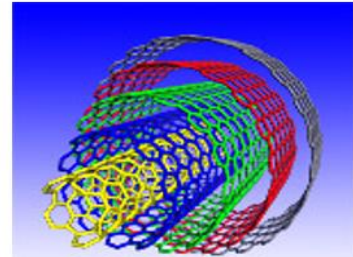
Applications of rare earth elements in mobile and car Sports Applications of Nano-Technology

By
Ms. Falguni Parmar

**TENNIS RACKETS, GOLF CLUBS, BASEBALL and
SOFTBALL BATS- all made with high strength, lightweight
plastic composites that contain Carbon Nanotubes**

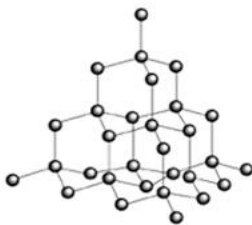


Carbon nanotubes are stronger than steel, lighter than feathers, conducting or semi-conducting, great thermal conductors, and radiation hard

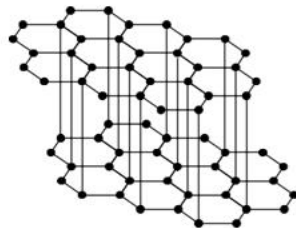


Carbon Is the Stuff of Many Nanotechnologies

By
Ms. Jasmin Vaishnav



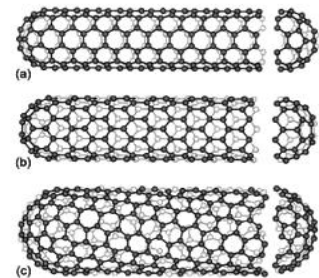
Diamond



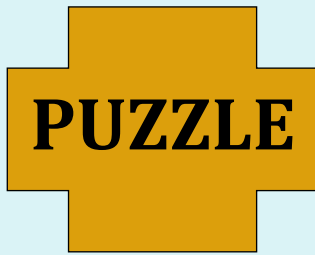
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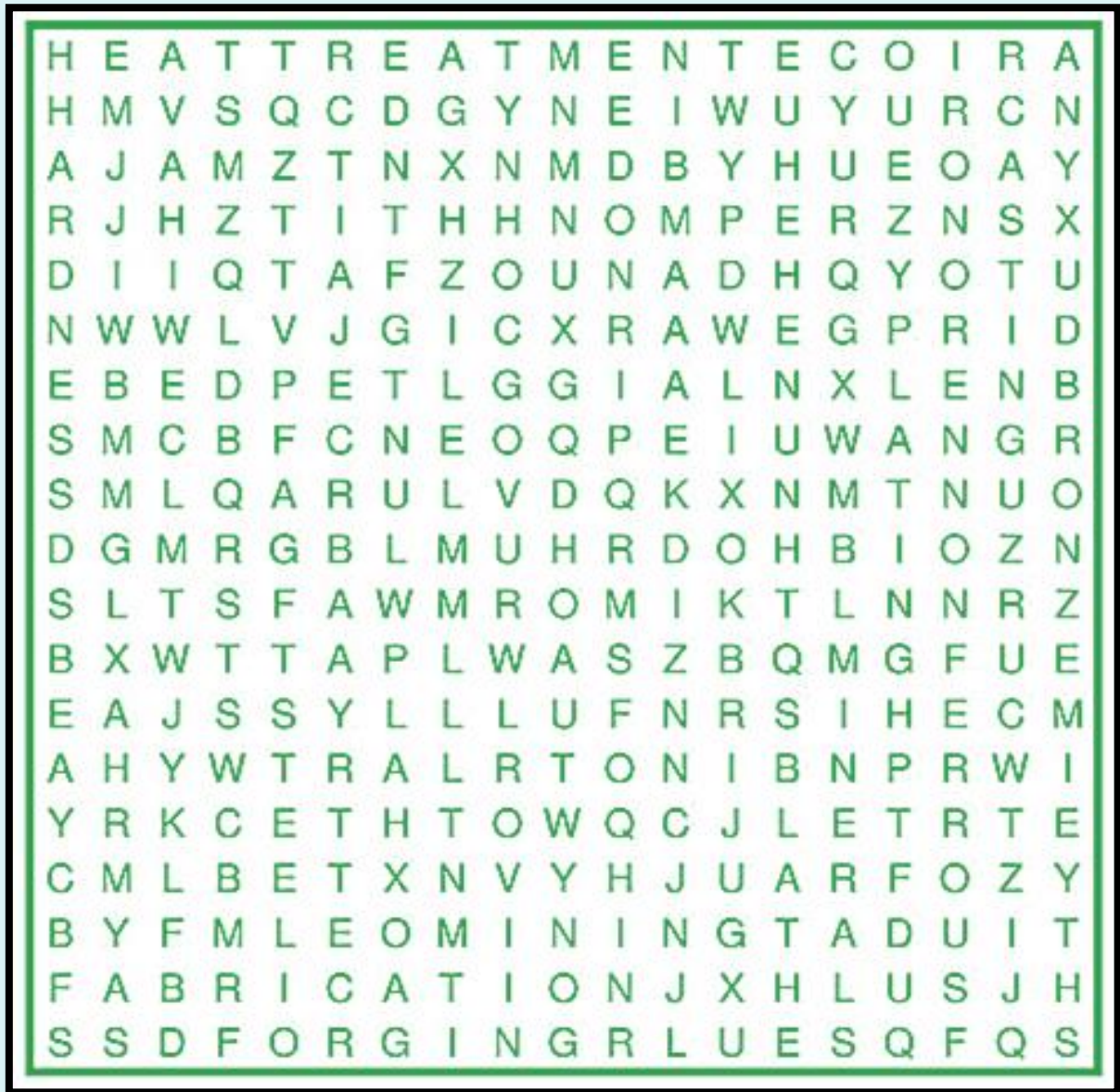
Fullerenes



Nanotubes



METALLURGY WORD SEARCH



Answers:

STEEL	MINERALS	HARDNESS	CRYSTALLOGRAPHY
SMELTING	METALWORKING	FORGING	CASTING
PLATING	LATHE	FABRICATION	BRONZE
NONFERROUS	IRON ORE	EXTRUSION	ALUMINUM
MINING	HEAT TREATMENT	EXTRACTION	ALLOY

POEM

Metallurgy

Inside the machine a metallic unease
Of violence at rest like between thunderclaps
It's a great white shark with teeth apart
Lair of the white worm of fire
In which metal sludge forms
Composed of sand grease and iron filings
Mostly it was a job for younger guys
Because you had to slip in slenderly
And crouch down midst the parts
Moving out half-buckets at best

I'd emerge dipped in vats of silver
More alloy than clay in my brilliance
Skin tingling with star points
And like a meteor hurtling home

Salvatore Ala

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Newsletter

MATERIALS

