

Virat wishes 'better half'
Anushka on 37th b'day: We love
you so much more everyday

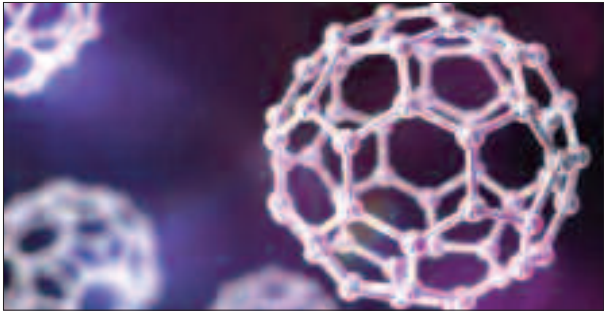


As his “better half” turned 37 on Thursday, star cricketer Virat Kohli penned a mushy note for Anushka Sharma, whom he called his best friend and safe space. Virat took to Instagram, where he shared a picture of himself with his wife Anushka. The image shows the couple warmly embracing each other outdoors in a natural setting. Virat can be seen wearing a light beige shirt and matching shorts, along with round glasses and a smartwatch. He has a beard and tattoos on his left arm. Anushka is wearing a sleeveless white top with matching white shorts. The two are looking at the camera and smiling. “To my best friend, my life partner, my safe space, my better half , my everything. You’re the guiding light of all our lives, We love you so much more everyday. Happy birthday my love,” Virat wrote as the caption. Anushka and Virat got married in 2017 in Tuscany, Italy, amidst family and close friends. They welcomed their firstborn, a daughter named Vamika, in 2021. They had their son, whom they named Akaay, in 2024. In other news, the couple is moving to London. Bollywood actress Madhuri Dixit's husband, Sriram Nene, spoke about the topic during a chat with YouTuber Ranveer Allahbadia, saying that it was becoming increasingly difficult for both the stars to raise their children in India due to the spotlight. “They were thinking about moving to London because they can’t enjoy their success (here). Anything they do attracts attention. We almost become isolated,” Nene had said in the podcast. He added, "Anushka and Virat are lovely people who just want to raise their kids normally." On the acting front, Anushka was last seen on screen in the 2018 film “Zero.” She will next be seen in “Chakda Xpress,” a biopic of Jhulan Goswami.

Overview of Nanoparticle

Also known as the zero-dimensional nanomaterials, nanoparticles are particles whose dimensions are below 100nm. These microscopic particles have unique properties that make them suitable for immense chemical reactivity, bio mobility, and energy absorption. Nanoparticles naturally occur in the environment but also are artificially synthesized. They are applied extensively in the development of modern medicine. It includes sophisticated processes like contrast agents in medical imaging and gene transfer into a cell. Engineering, catalysis, and environmental remediation are also areas where nanotechnology gets used widely. One of the biggest challenges is the toxicity which the nanoparticles pose to society and the environment. Nevertheless, nanoparticles are a boon to the modern world.

Size of the Nanoparticles: Nanoparticles are invisible to the human eye. They exhibit significant chemical and physical changes in the larger materials. As their size approaches that of the atomic particles, their properties get modified even more. Each nanoparticle has a few thousand atoms. As the particles reduce in size more and more, their surface area to volume ratio increases, resulting in



the surface atoms dominating the material. Moreover, these nanoparticles are enormously small and are able to confine the electrons present in them and produce quantum effects. The surface area of the nanoparticles is even larger than that of powders, plates, or sheets.

Physicochemical Properties of Nanoparticles: Mechanical strength, large surface area, optical and chemical reactivity are properties that make the nanoparticles unique. However, there are several other physicochemical properties:

1. Noble metal nanoparticles are size-dependent in their optical properties. They have a UV-visible spectrum band that is not present in bulk metals. It appears when excited by the Localized Surface Plasmon Resonance (LSPR) and results in wavelength selection absorption and molar excitation. Ray

light scatters along with enhancing electromagnetic fields. Hence the optical and electronic properties are interdependent.

2. The nanoparticles work best when their diameter is less than the critical value. The magnetic properties of the particles are very effective below 10-20 nm. It makes them useful for several applications.
3. When compared to microparticles, nanoparticles show dissimilar mechanical properties. The mechanical parameters such as hardness, elastic modulus, stress and strain, adhesion, and friction are determined. They are used to analyze if the nanoparticles have a usage in nanomanufacturing and nanofabrication.
4. The nanofluids are used in specialized heat transfer phenomenon's. The thermal conductivity of these fluids is more enhanced than that of conventional fluids. The

metal nanoparticles have conductivities 1000 times greater than the fluids.

Uses and Applications of Nanoparticles: Nanoparticles are produced by engineering methods or through combustion techniques. Healthcare, cosmetics, environmental preservation, and air purification are processes that involve nanoparticle technology. These particles transport chemotherapeutic drugs across the human body for the treatment of cancer. They can transfer even to the regions where the arteries are damaged. Aerospace engineers use carbon nanotubes for the morphing of aircraft wings. Zinc oxide nanowires applied in the solar cells help in environmental preservation. The nanoparticles hence have several other applications.

Give Some Nanoparticles Examples.

Answer: There are several kinds of nanoparticles based on their morphology. For example, some nanoparticles get prepared from the precursors of metals. These metal nanoparticles get synthesized by chemical, electrochemical, or photochemical methods. They have high surface energy and hence can absorb small molecules. In scanning electron microscopes, gold nanoparticles are used for analyzing a sample.

Modern Indian History



- 1.Which of the following war led the British to switch to policy of “masterly inactivity”?
[A] First Anglo-Afghan War
[B] Second Anglo-Afghan War
[C] First Anglo-Sikh War
[D] First Anglo-Maratha War
- 2.Which of the following were born in India or were residents of India but were not Indian citizen when they received the Nobel Prize?
[A] Dalai Lama
[B] Rudyard Kipling
[C] Ronald Ross
[D] All of the above
- 3.In which pact, warm relations were established between Garam daland Naram dal, the two groups of the Indian National Congress?
[A] Lucknow Pact
[B] Karachi agreement
[C] Gandhi-Irwin Pact
[D] Lahore declaration
- 4.Who is called the ‘Father of the Indian National Congress’?
[A] Surendra Nath Banerjee
[B] Mahatma Gandhi
[C] A.O. Hume
[D] Lokmanya Tilak
- 5.Srirangapatnam Fort is located in ____:
[A] Tamil Nadu

- [B] Karnataka
[C] Kerala
[D] Telangana
- 6.Veer Kunwar Singh Jayanti is celebrated in _____ in order to recognise the achievements of Kunwar Singh during the Indian rebellion of 1857:
[A] Uttarakhand
[B] Bihar
[C] Uttar Pradesh
[D] Himachal Pradesh
 7. The India Independence Bill was first presented in the House of Commons in London on ____:
[A] July 4, 1947
[B] July 14, 1947
[C] August 1, 1947
[D] August 10, 1947
 - 8.165. In which year was the Non-Cooperation Movement launched?
[A] 1865 [B] 1877
[C] 1919 [D] 1920
 - 9.On April 12, 1944

- Subhash Chandra Bose hoisted the INA Flag in a town. In which State/ Union Territory is that town now?
[A] Manipur
[B] Andaman and Nicobar Islands
[C] Tripura
[D] Mizoram
- 10.Identify Fort St. George and Fort William with their respective settlements?
[A] Bombay and Madras
[B] Bombay and Calcutta
[C] Madras and Calcutta
[D] Calcutta and Madras
 - 11.In which of the following books of Mahatma Gandhi, he called the British Parliament as sterile and prostitute?
[A] Sarvodaya or Universal dawn
[B] An Autobiography or the story of my experiments with truth
[C] Hind Swaraj
[D] The Story of a Satyagrahi
 - 12.Anglo-Chinese agreement was signed in which of the following years?
[A] 1890 [B] 1900
[C] 1910 [D] 1920

Answer
1. A, 2. D, 3. A, 4. C, 5. D, 6. B, 7. A, 8. D, 9. A, 10. C, 11. C, 12. A

Eyes and Myopia

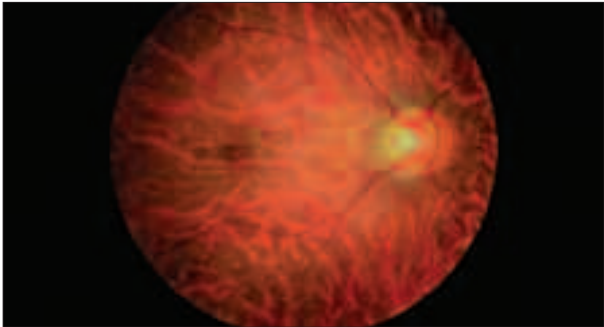
The eyes are the sense organs of sight in our body. Each eye is a spherical-ball like structure and is referred to as the eyeball. The ability of the eye to see the object equally clear from various distances is called the power of accommodation. However, this power of accommodation can get defective at times. Like some times the eye is not able to see distant objects for eg. Highway signs clearly while sometimes it is not able to see near objects clearly. Here we are going to learn about the defect of the eye where distant vision is blurred while near vision is clear. Such a condition or abnormality of the eye is known as myopia. Let's study this defect of the eye (myopia) in detail.

What Is Myopia?

Myopia is an eye defect or common abnormality of the eye in which the near vision is clear while distant vision is blurred. This condition is known as myopia also it is called near or short-sightedness.

Retina is that part of the eye which provides a surface for image formation. In myopia what happens is light rays entering the eyes converge too soon and are brought to focus before reaching the retina hence the image cannot be formed on the retina.

Causes Of Myopia: This eye defect called myopia can



be caused basically due to the defected eye structure.

Structure of the eye causing myopia can have two defects:

- The eye lens becomes too convex or curved
- Depth of the eyeball is too much i.e. eyeball lengthened from front to back. When the length of the eyeball is too long as compared to the focusing power of the lens of the eye and cornea. Because of this, the light rays focus at a point in front of the retina and not on the retina itself.

Because of the above mentioned defects in the eye structure, the light that enters our eye doesn't focus correctly. Hence, images are formed in front of the retina which is the light-sensitive part of our eye instead of being formed directly on the retina which causes blurred vision.

Myopia is also referred to as the refractive error.

In the above diagram, we can see that due to the eye lens being too convex or curved

the image formation that should happen on the retina is happening in front of the retina. Thus, causing blurred vision of distant objects known as myopia.

Types of myopia:

Simple Myopia - In this, the eye of a person is almost healthy, wearing glasses or contact lenses of suitable power can easily correct the defect and can correct the issue of a person's eye vision.

High Myopia - High myopia is a severe form of myopia. When a person is diagnosed with myopia at a young age then with the growing age this defect becomes worse. High myopia increases the chances of development of other eye problems such as cataract, glaucoma etc.

Pathological Myopia - This condition is also called degenerative myopia. It can also cause blindness and cannot be cured by lenses or glasses.

- 1.Which city hosted the 'National Conference On Rural WASH Partners' Forum'?
[A] Mumbai
[B] New Delhi
[C] Pune
[D] Varanasi
- 2.Which state/UT hosted the 'Semicon India 2023' exhibition?
[A] Maharashtra
[B] New Delhi
[C] Uttar Pradesh
[D] Gujarat
- 3.The first in-person follow-up event of BRICS Urbanisation Forum is set to be organised in which country?
[A] India
[B] South Africa
[C] Australia
[D] Japan
- 4.‘Bali Paragraphs’ which was seen in the news, is associated with which bloc?
[A] European Union
[B] G-20
[C] G-7
[D] ASEAN
- 5.Which country hosted the recent session of the ‘Commission on Genetic Resources for Food and Agriculture (CGRFA)’?
[A] Italy
[B] USA
[C] Israel
[D] Kenya



- 6.Which state hosted the awareness program named ‘Anu Awareness Yatra – 2023’?
[A] Tamil Nadu
[B] Kerala
[C] Andhra Pradesh
[D] West Bengal
- 7.‘Akhil Bhartiya Shiksha Samagam’ was organised to commemorate the anniversary of which scheme/policy?
[A] Beti Bachao; Beti Padhao
[B] National Education Policy
[C] Samagra Shiksha
[D] Sarva Shiksha Abhiyan
- 8.Which city is the host of the ‘National Conference on Nalanda Buddhism’?
[A] Guwahati
[B] Patna
[C] Leh
[D] Shillong
- 9.Which country is the host of international conference on ‘Preserving

- Information Integrity and Public Trust in Elections’?
[A] India
[B] Brazil
[C] France
[D] Australia
- 10.Which country hosted the Camp David Summit in 2023?
[A] Australia
[B] Russia
[C] USA
[D] UK
 - 11.Which country is the host of ‘World Water Week 2023’ event?
[A] Sweden
[B] USA
[C] Sri Lanka
[D] Bangladesh
 - 12.Which country is the host of ‘Assembly of the Global Environment Facility (GEF)’?
[A] Canada
[B] Germany
[C] Finland
[D] Australia
 - 13.Which city is the host of the ‘G20 workshop on Climate Resilient Agriculture’?
[A] Bengaluru
[B] Amritsar
[C] Hyderabad
[D] Chennai
 - 14.Which city is the host of ‘Second edition of Naval Commanders’ Conference, 2023’?

- [A] New Delhi
[B] Varanasi
[C] Pune
[D] Mussoorie
- 15.Which city is the host of Transnational Grid Interconnections for One Sun, One World, One Grid (OSOWOG) Conference?
[A] New Delhi
[B] Mumbai
[C] Gandhi Nagar
[D] Bengaluru
 - 16.Which city hosted the ‘National Conference on ‘Moving Mental Health Beyond Institutions’?
[A] Mumbai
[B] Pune
[C] New Delhi
[D] Mysuru
 - 17.What is the theme of the ‘Summit on ‘Global Chemicals and Petrochemicals Manufacturing Hubs in India’?
[A] Sustainability and Circularity
[B] Sustainability and Fertility
[C] Sustainability and Chemicals
[D] Sustainability and Manufacturing

Answer
1. B, 2. D, 3. B, 4. B, 5. A, 6. A, 7. B, 8. C, 9. B, 10. C, 11. A, 12. A, 13. C, 14. A, 15. A, 16. C, 17. A.

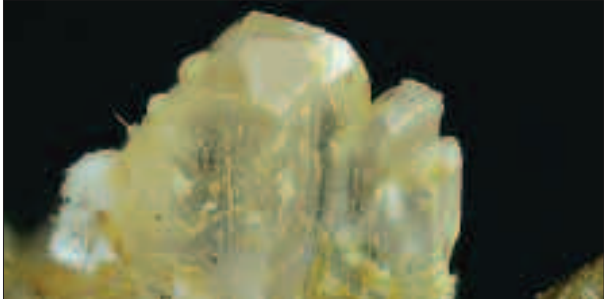
Overview of Monoclinic Crystal System

The monoclinic system is the structural category of crystalline solids. Well, crystalline solids can be categorized according to the structure of crystals. In the monoclinic system, crystals are referred to mainly three axes, a, b, and c, where axes a is perpendicular to axes b and c, but simultaneously, a and b are not perpendicular to each other. Suppose atom groups or atoms in crystalline solids are represented by points and lattices when points are connected with each other. The monoclinic unit cell is differentiated by a single axis called two-fold symmetry, where the monoclinic unit cell can be rotated by 180 degrees without disturbing appearance. Some of the solids that belong to the monoclinic crystal system are borax, gypsum, beta-sulfur, orthoclase, muscovite, kaolin, clinoclinoamphibole, azurite, jadeite, and spodumene.

What is Crystallography and its Types?

Crystallography is the study of the arrangement of bonds of atoms in crystalline solids. In this system, mainly atoms arrangement is studied based on the crystal lattice. In modern days, DNAs and minerals are examined through crystallography. Well, many kinds of crystal systems are used nowadays. All the structure is defined based on three factors: how many axes used, length, and angles of the axis.

Six different crystal systems are isometric system, tetragonal system, orthorhombic system, monoclinic system, triclinic system, hexagonal system, trigonal



subsystem. All these systems have three axes, and the direction of the axis indicates the sides. The longest axis is C, and the shortest axis is A, and axis B is also there; in some systems, you can see axis D.

Monoclinic Crystal Shape And Monoclinic Crystal Angles: In crystallography, the monoclinic crystal system is one of the practical crystal systems. Three vectors describe a crystal system. In the monoclinic system, the quartz is described by vectors of inequitable lengths, as in the orthorhombic system forming a rectangular type prism with a parallelogram base. Hence two combinations of vectors are perpendicular (join at right angles), while the third pair forms an angle other than 90°.

- Orientation of a crystal has few constraints – where b is the only fixed axis by symmetry.
- Axis C is generally chosen based on cleavage and habit.
- α and $\gamma = 90^\circ$
- In some cases, the b axis will be 90 degrees that result in pseudo- orthorhombic form.

- Symmetry operation in a monoclinic system, the unprecedented operation is 2/m – a twofold axis of rotation with a mirror plane.
- The axis b is the rotation, while c and a lie in the mirror plane
- Monoclinic crystals have two forms: pinacoids and Monoclinic shape crystals have two shapes: pinacoidal and prisms.
- Common monoclinic rock-forming crystals include clinopyroxene, orthoclase, mica, and titanite.

Orthorhombic System In Crystallography: As we have discussed, crystallography has many types, and the orthorhombic system is one of them. Orthorhombic lattices are formed by extending cubic lattices with two orthogonal pairs by two different factors. While raising the cubic lattice with the two factors, a rectangular prism is formed, and axis a and b form the rectangular prism base. Axis c determines the height of the prism in the orthorhombic system in crystallography. Here all three-axis a, b, and c are different and intersect each other at the rectangle. Hence, all the

three orthorhombic lattice vectors remain mutually orthogonal.

- In Orthorhombic crystallography, all the three-axis are of a distinct length that is mutually perpendicular to each other.
- Convention has it that a crystal is oriented so that c is the most significant axis and a minor axis.
- In such a case, b is taken as unity, and after that, you can calculate ratios.
- The unique symmetry operation in an orthorhombic system is The special symmetry operation in an orthorhombic system is 2/m 2/m 2/m – Three twofold axes of rotation coinciding with the three crystallographic axes.
- There are three types of patterns in the class: prisms, pinacoids, and dipyrramids.
- Common orthorhombic rock-forming minerals incorporate andalusite and sillimanite, olivine, orthopyroxene, and topaz.

Forms of Orthorhombic System in Crystallography: The orthorhombic system has two types of forms, unique form, and general form. A possible form has the maximum number of faces of any pattern in its crystal class. Particular forms may appear in any crystal class of the system. In general form, three-axis a, b, and c intersect with each other at a specific angle, and it will never be zero. Different forms are pyramid, prisms, domes, disphenoid, phenoid, pedion, pinacoids, and dipyrmaid.

MCQ on Government Schemes

- 1.‘Meendum Manjappai’ is a scheme launched by which Indian state, to curb plastic usage?
[A] Kerala
[B] Tamil Nadu
[C] Andhra Pradesh
[D] Odisha
- 2.As per recent data, which city topped in terms of completion of projects, fund usage and other criteria under Smart Cities Scheme?
[A] Surat
[B] Madurai
[C] Bhopal
[D] Mysuru
- 3.Prime Minister Narendra Modi launched Janjadya Aadivasi Nyaya Mahabhiyaan from which state?
[A] Madhya Pradesh
[B] Chhattisgarh
[C] Bihar
[D] Jharkhand
4. Which state/UT launched the ‘Water Smart Kids’ Campaign?
[A] Assam
[B] Meghalaya
[C] Sikkim
[D] West Bengal
- 5.Which Indian city launched ‘Safe City Command Centre’ to curb crimes against women?
[A] Lucknow
[B] Bengaluru
[C] Patna
[D] New Delhi
- 6.What is the new name of Ayushman Bharat Health and Wellness Centres?

- [A] Ayushman Arogya Mandir
[B] NaMO Ayushman Mandir
[C] Bharat Arogya Mandir
[D] Naya Bharat Mandir
- 7.PM JANMAN scheme, which was launched recently, is associated with which category of people?
[A] MSME Owners
[B] PVTGs
[C] Farmers
[D] NRIs
 - 8.Which Union Ministry is associated with the ‘Rubber (Promotion and Development) Bill, 2023’?
[A] Ministry of MSME
[B] Ministry of Commerce and Industry
[C] Ministry of Labour and Employment
[D] Ministry of Power
 - 9.Which Union Ministry launched ‘HaritSagar’ Guidelines?
[A] Ministry of Ports, Shipping and Waterways
[B] Ministry of Jal Shakti
[C] Ministry of Power
[D] Ministry of Defence
 - 10.Which state impalements ‘Maha Lakshmi scheme’, aimed at providing free travel to women in buses?
[A] Tamil Nadu
[B] Telangana
[C] Kerala
[D] Odisha
 - 11.‘Suchitwa Theeram’ Project, which was seen in the news, was launched by which state?
[A] Jharkhand

- [B] Gujarat
[C] Odisha
[D] Kerala
- 12.Which Union Ministry is associated with ‘Mera Gaon, Meri Dharohar (MGMD) Programme’?
[A] Ministry of Culture
[B] Ministry of Rural Development
[C] Ministry of MSME
[D] Ministry of Housing and Urban Affairs
 - 13.Which Union Ministry is associated with Unique Disability ID (UDID) project?
[A] Ministry of Health and Family Welfare
[B] Ministry of Social Justice and Empowerment
[C] Ministry of Women and Child Development
[D] Ministry of Finance
 - 14.Which Indian state/UT launched ‘Abua Bir Dishom Abhiyan’?
[A] Kerala
[B] Jharkhand
[C] Odisha
[D] West Bengal
 15. The ‘A A I N A Dashboard for Cities’ portal has been launched by which Union Ministry?
[A] Ministry of MSME
[B] Ministry of Housing and Urban Affairs
[C] Ministry of Commerce and Industry
[D] Ministry of Electronics and IT

Answer
1. B, 2. A, 3. D, 4. B, 5. B, 6. A, 7. B, 8. B, 9. A, 10. B, 11. D, 12. A, 13. B, 14. B, 15. B.