TRAI's New Rule to Curb Spam

Source: PIB

Recently, the Telecom Regulatory Authority of India (TRAI) has introduced a mandate requiring telecom firms to block messages containing unregistered **Uniform Resource Locators (URLs),** over-the-top (OTT) **links, Android Application Packages (APKs),** or call-back numbers starting from 1st September 2024.

- The new rule, aimed at **reducing spam and** phishing **attempts,** requires institutions to register and **whitelist** (or allowlist - a list of acceptable entities) their numbers to send one-time passwords (OTPs), which may impact banks and services using OTPs for transactional alerts or authentication.
    - Telecom companies will now need to verify the content of messages before delivery, enhancing security.
- TRAI has also mandated that **telemarketing calls starting with the 140-series** (assigned to telemarketers) will have to be migrated to an online DLT (digital ledger **technology) platform** or on blockchain to enable better monitoring.
- To further curb spam, telecom operators are directed to **monitor and disconnect bulk connections** used for promotional and spam calls.
- TRAI was established in 1997 by the **Telecom Regulatory Authority of India Act, 1997,** to regulate telecom services, including fixation/revision of tariffs for telecom services **which were earlier vested in the Central Government.** Its headquarters is in New Delhi.
    - Its main objective is to provide a fair and transparent policy environment that promotes a level playing field and facilitates fair competition.

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New Chairman of ICC

Source: HT

Recently, Jay Shah has been elected as the new chairman of the International Cricket Council (ICC), becoming the **youngest** ever to reach this position.

- He currently holds the position of Board of Control for Cricket in India (BCCI) secretary and will take over the charge at ICC from **1st December, 2024,** succeeding Greg Barclay of New Zealand as ICC chairman
- He became the **fifth Indian** to become ICC chairman after Jagmohan Dalmiya, Sharad Pawar, N Srinivasan and Shashank Manohar.
- **About ICC:**
    - **Establishment:** Imperial Cricket Conference (as the ICC was originally called) was founded in **1909**. It became the International Cricket Council in **1989.**
    - **Function:**The ICC is the **global governing body** for cricket. It organises major international tournaments, including the **ICC Cricket World Cup**, ICC T20 World Cup, and

ICC Champions Trophy.
    - **Membership:** The ICC has **108 members** as of 2024, consisting of 12 Full **Members** who play Test matches and **96 Associate Members.**
    - **Headquarters:** Dubai, UAE

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Security Alert System Based on Piezoelectric Polymer Nanocomposite

Source: PIB

Why in News?

Recently, the researchers from **Centre for Nano and Soft Matter Sciences (CeNS)** and **National Chemical Laboratory (CSIR-NCL), Pune** have developed a novel **piezoelectric polymer nanocomposite for pressure sensing** and **energy harvesting.**

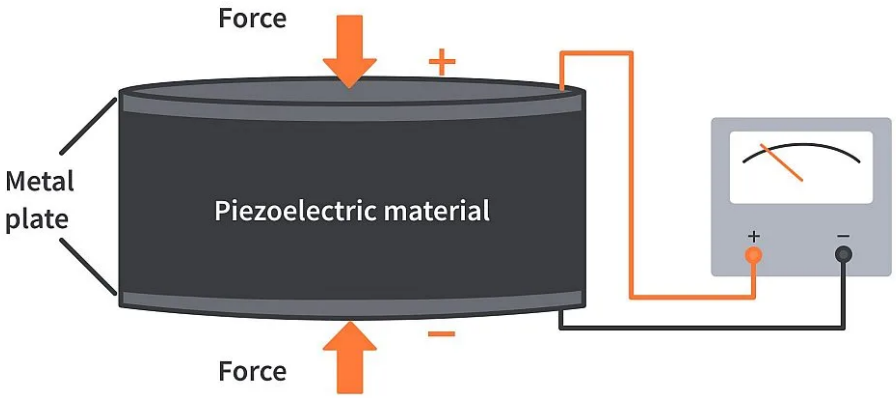
- This can efficiently convert **mechanical energy into electrical energy** opening new avenues for applications in energy harvesting and pressure sensing.

What are Piezoelectric Polymer Nanocomposite?

- **Piezoelectric Materials/ Effect:**
    - Piezoelectric materials are materials that can **produce electricity when applied to mechanical stress.** When pressure is applied to such materials, the centres of positive and negative charges shift, creating an **external electric field.**
    - **Examples:**
        - **Natural materials:** Quartz, topaz, and tourmaline.
        - **Organic materials:** Silk, wood, and bone.
        - **Ceramics:** Lead zirconate titanate (PZT) and barium titanate (BT).
        - **Polymers:** PVDF and PVDF-TrFE.
        - **Ferroelectric materials:** Barium titanate ($BaTiO_3$) generates electric charge without mechanical pressure.
    - **Applications:**
        - Piezoelectric materials are used in various applications, including microphones, electric pickups for stringed instruments, sensors, actuators, frequency standards, piezoelectric motors, and noise and vibration reduction.
- **Polymer:**
    - A polymer is a large molecule composed of chains or rings of linked repeating subunits called **monomers,** typically having high melting and boiling points due to their high molecular masses.
        - Natural polymers include silk and DNA, while synthetic polymers, like nylon and polyethylene, are made from oil or bio-based sources.
- **Piezoelectric Polymers:**
    - These are **polymers** that can generate electric charges on the surface under pressure/strain thus converting mechanical energy into electrical energy.
    - **Example**: Poly(vinylidene fluoride), also known as **PVDF**, Poly(vinylidene fluoride-trifluoroethylene) copolymer or **P(VDF-TrFE).**
- **Polymer Nanocomposites:** These are materials **made from polymer matrices** combined with small percentages of **nanometer-sized additives**, aimed at **enhancing the properties of polymers** such as mechanical, thermal, and electrical characteristics.
    - **Nanomaterials** are the material having structural components with **at least one**

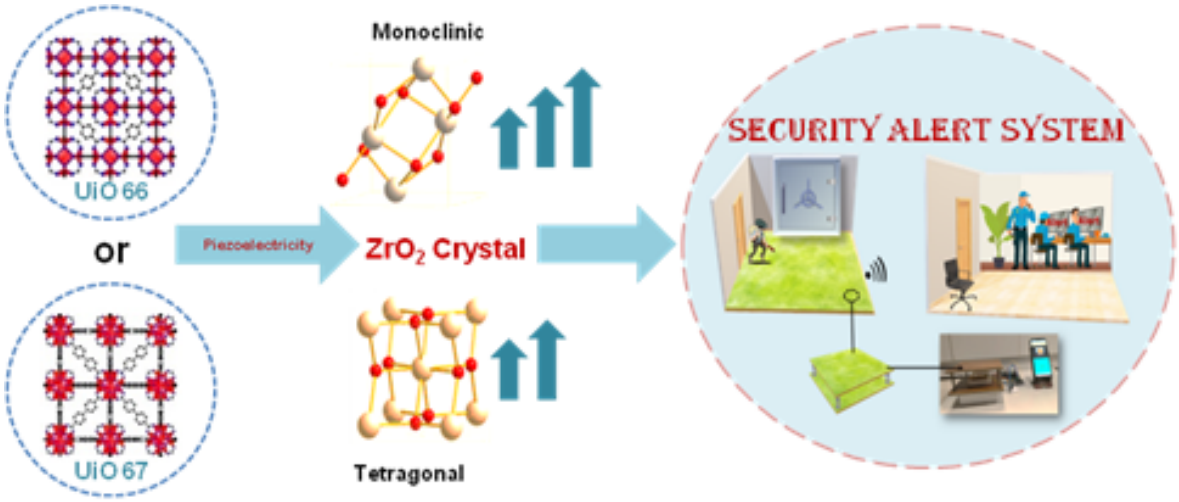
dimension in the nanometer scale, that is, **1-100 nm.**

- **Nanocomposite** is a solid material made up of two or more different substances, where at least one of these substances has dimensions in the nanoscale range, specifically between 1 nm and 3 nm. //



What are the Key Facts About the Study?

- **About:**
  - The researchers aimed to study how the **different crystal structures of the zirconia nanoparticles affected the piezoelectric capabilities** of the composite material.
- **Process:**
  - Researchers created two types of **zirconia-based Metal-organic frameworks (MOFs) (UiO-66 and UiO-67)** and converted them into zirconia nanoparticles.
    - **Metal-organic frameworks (MOFs)** are crystalline materials composed of metal ions or clusters linked to rigid organic molecules, resulting in one-, two-, or three-dimensional porous structures.
  - Then **these nanoparticles** are mixed with a piezoelectric polymer called **poly(vinylidene difluoride) (PVDF)** to make **polymer nanocomposite films.**
- **Findings:**
  - Researchers found that the **surface properties and crystal structure** of the nanoparticles significantly **influenced the piezoelectric performance** of the polymer.
- **Practical Applications:**
  - **Security Alert System**: A **Bluetooth-based security alert system u**ses a **piezoelectric pavement prototype** that generates voltage from footsteps.
    - If unauthorised entry is detected, the system activates and sends alerts to a connected device, like an Android smartphone, via Bluetooth.
  - **Electricity Generation:** The prototype can also **generate electrical energy from mechanical energy input.**
    - This feature is particularly beneficial in **enhancing the efficiency of energy use** in smart cities and **automated security systems.**



UPSC Civil Services Examination, Previous Year Question (PYQ)

Prelims:

Q. Consider the following statements: (2022)

1. Other than those made by humans, nanoparticles do not exist in nature.
2. Nanoparticles of some metallic oxides are used in the manufacture of some cosmetics.
3. Nanoparticles of some commercial products which enter the environment are unsafe for humans.

Which of the statements given above is/are correct?

(a) 1 only

(b) 3 only

(c) 1 and 2

(d) 2 and 3

Ans: (d)

Q. There is some concern regarding the nanoparticles of some chemical elements that are used by the industry in the manufacture of various products. Why? (2014)

1. They can accumulate in the environment, and contaminate water and soil.
2. They can enter the food chains.
3. They can trigger the production of free radicals.

Select the correct answer using the code given below:

(a) 1 and 2 only

(b) 3 only

(c) 1 and 3 only

(d) 1, 2 and 3

Ans: (d)

Return of Guru Granth Sahib Copies to India

Source: IE

Recently, two saroops (copies) of the Guru Granth Sahib were returned to the Indian embassy in Doha, Qatar.

- In December 2023, Qatari authorities **confiscated** two Sikh holy books from individuals accused of operating a religious establishment without approval.
- **About Saroop**: Saroop is a **physical copy** of Sri Guru Granth Sahib, also called **Bir** in Punjabi.
    - Every Bir has **1,430 pages,** which are referred to as **Ang.**
    - The Sikhs consider the saroop of Guru Granth Sahib a **living guru** and treat it with utmost respect.
    - Guru Arjan Dev (**5th Sikh guru)** compiled the **first Bir** of the Guru Granth Sahib in **1604**, and installed it at the **Golden Temple** in Amritsar.
    - Later, Guru Gobind Singh (**10th Sikh guru)** added verses penned by Guru Tegh Bahadur (**9th Sikh guru)** and compiled the **Bir** for the **second and last time.**
- **About Guru Granth Sahib: I**t is a compendium of hymns written by six Sikh gurus, 15 saints, including Bhagat Kabir, Bhagat Ravidas, Sheikh Farid and Bhagat Namdev, 11 Bhatts (balladeers) and four Sikhs.
    - The verses are composed in **31 ragas.**
    - In **1708,** Guru Gobind Singh declared the Guru Granth Sahib the **living Guru** of the Sikhs.

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Guru Padmasambhava

Source: PIB

A two-day conference on the **Life and Living Legacy of Guru Padmasambhava** was held in Nalanda, Bihar, organised by the International Buddhist Confederation (IBC) and Nava Nalanda Mahavihara.

- The event will focus on Guru Padmasambhava's adaptation of Buddhist teachings to local cultures and traditions.
- Guru Padmasambhava, also known as **Guru Rinpoche**, was an 8th-century sage whose teachings significantly shaped the **dissemination of** Buddha Dhamma across the Himalayan region and is regarded as the **second Buddha.**
- Guru Padmasambhava, one of the founding fathers of **Tibetan Buddhism**, appeared in Tibet in 749 A.D. The other two founders were **Acharya Shanta Rakshita and prevalent king Thisong Deotsen.**
    - Tibetan Buddhism is the **Vajrayana (Tantric)** form of Mahayana Buddhism from India.
- The **Nyingma Sect's teachings** are based on Padmasambhava. The teachings are classified into **nine yanas, with Dzogchen (Great Perfection) being the most important.**
    - Dzogchen focuses on pure awareness through meditation, and the **Vajrayana tradition involves ritual, symbols, and tantric practices to achieve nirvana**.
- The **IBC is a Buddhist umbrella body based in New Delhi** that serves as a common platform for Buddhists worldwide. It currently has a membership of more than 320 organisations in 39 countries.

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