



SCO-Young Scientist Profile

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Details of research work carried out in S&T (*limit to 200 words*)

The role of nanotechnology is becoming prominent with the passing years. One such nanoparticle which is finding its way in many applications is Graphene.

When Graphene was discovered in 2004, the science community didn't realize the exotic portal of graphene applications which was opened at that time. A cheap material becoming an option for many costly materials. Graphene is covalently bonded hexagonal lattice of carbon atoms. Its stability is due to tightly packed carbon atoms and a sp_z orbital. The covalent bonding between each carbon atom of graphene makes it so strong that it is emerging as the strongest material surpassing steel by 200 times. Its electron mobility is faster than any known material which gives unique electronic properties. Being only one atom thick it is almost transparent; it transmits about 97-98% of light. The sheets of graphene are so closely knit carbon atoms that they work like atoms and could be used for trapping and detecting gases.

Graphene recently entered in the fight against COVID-19. Graphene's physiochemical and anti-microbial properties suggest that it may be used for development of diagnostic devices for

SARS-CoV-2 detection and development of PPEs and 3D printed medical components.

If Silicon was star material of 20th century, Graphene is becoming a one in 21st century.

(210 words)

Associated SCO-YSC Theme: Combating COVID-19 and emerging epidemics through research and innovation

Statement of Innovation *(Brief information on new innovative ideas including startup / entrepreneurs- limit to 150 words)*

My interest in Graphene arose during a summer internship on the topic '2D materials and its applications'. Since then I have been exploring this material. Graphene is incredibly strong, light and flexible. It's even used in bulletproof vests, so it can definitely resist impacts. Be it energy industry, medicine, electronics, food industry, sports, its applications are unlimited and promise to revolutionize many fields.

Graphene is called the 'wonder material' for a reason. There are thousands of ongoing research on it. It could open a door to controlling viruses and bacteria.

Graphene's physiochemical and anti-microbial properties suggest that it may be used for development of diagnostic devices for SARS-CoV-2 detection and development of PPEs and 3D printed medical and engineering. Graphene is proving to be the most promising candidate for new innovation in town. The abundant properties of this material can be utilized in different ways to achieve a common goal. (150 words)

Major awards/ Achievements *(Upto 3 awards)*

1. Qualified for Summer Research Training Programme SRTP – 2020 organized by CSIR.

2. Qualified for 35th Inter University East Zone Youth Festival organized by All India University (AIU)

3. Qualified for 19th National Children's Science Congress organized by Department of Science and Technology (DST), Government of India

Shanghai Cooperation Organization- 1st Young Scientists Conclave (SCO-YSC 2020)

A virtual event organised in India at CSIR-IICT, Hyderabad

Theme: Shaping SCO-STI Partnership: Young Scientists Perspectives

Possible collaboration with SCO countries *(limit to 100 words)*

Key words *(relevant to research work conducted as well as proposed innovation, 5-6 words)*

Graphene, 2D materials, COVID-19, nanotechnology, nanoparticles