FUNCTIONAL NON-CARCINOGENIC NANOPARTICLES MANUFACTURED FROM FARM BASED PRODUCTS BY SHUKLA ASHAR IMPEX PVT. LTD; RAJKOT.

We have recently formulated **SPHERICAL SHAPED NANOPARTICLES** from agricultural produce extracts. These nanoparticles shows antimicrobial activity and can also be used for drug delivery. The uniqueness regarding these formulations is that obtained nanoparticles have spherical shapes and a very narrow size distribution (2 to 5 nm). These nanoparticles also could also be classified as "Sub-Nano" or "Quantum Dots" and can prove as a potent tool in bio medical field using nanotechnology.

Nanoparticles could prove to be a very important tool in biology and medicine. They have various applications in biomedical science such as bioimaging and drug delivery, including microbial treatments in maintaining a general hygiene standard in the hospitals and clinics.

The application of the nanoparticles can often be controlled by engineering their shape, size and surface functionality. Our research have successfully formulated the nanoparticles having spherical shape, a very uniform range of size and are non toxic and food grade. They are readily bio degradable. Surface functioning of nanoparticles is an effective way to control the interface between nanoparticles surface and the biological systems they are designed to interact with. Scientists all across the globe are into a study to have non toxic nanoparticles having the size distribution in the nano range which could be non toxic and otherwise harmless to the human body.

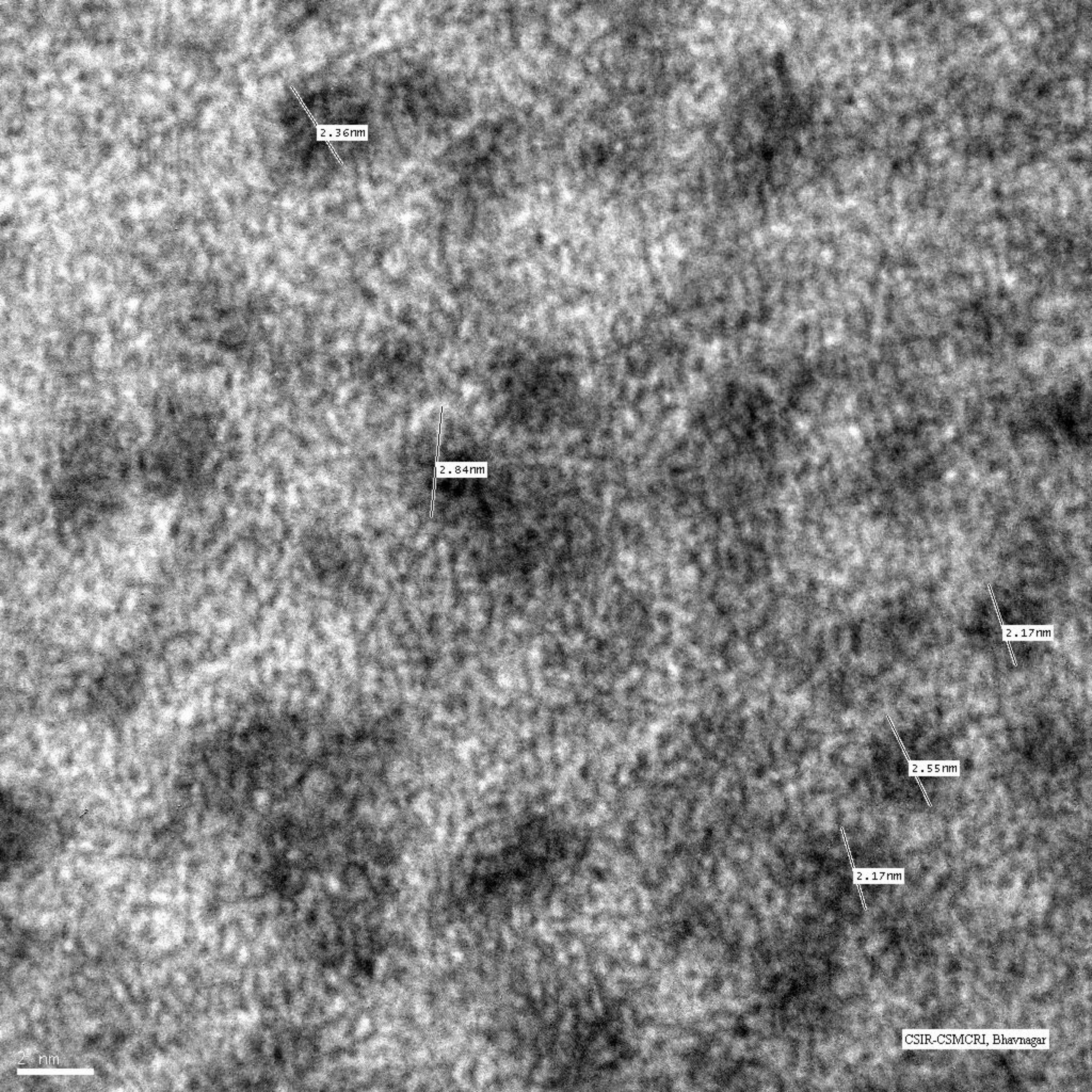
The nanoparticles formulated by us are found to have enhanced antimicrobial activity against microorganisms such as ***Escherichia coli, Bacillus subtillis, Staphylococcus aureus, Salmonella, Pseudomonas Aeruginosa, Bacillus Spizizenii, Candida Albicans and many more*****.** This is the first time that these formulations could prove to be effective against tuberculosis **(*Mycobacterium tuberculosis)*,** and is likely to be due to its spherical nanoparticle shape and small size of 2 to 5 nm. This has a vast potential to open up a further research area for biomedical applications for our nanoparticles in a major way.

The spherical shape of the particles is expected to prove to be a very effective tool in drug delivery and many new applications. Spherical shape provides greater surface area as well as spherical nanoparticles are more stable in aqueous suspension than nanofibers.

Scientists have successfully demonstrated one more phenomenon that the functionalized nanoparticles are extremely efficient in the stabilization of carbon nanotubes with minimal ultrasonication, hence saving energy. The carbon nanotubes are cylindrical nanostructures of carbon which are very valuable in nanotechnology, electronics and optics. It is very difficult to stabilize the aqueous solution of the carbon nanotubes for the reaction purpose. However, with the help of our extensive research, our Nano Colloids, been able to achieve highly stable dispersions. The said formulations are very stable even upon transmitting electron beam through them. Tests conducted at Central salt and Marine Chemicals Research Institute, Bhavnagar suggested this findings.

Our Nano colloids could potentially be used as functional nanoparticles, and has opened up various areas for research and its applications. These include biomedical applications, nanocolloidal aero gels, health, hygiene, animal protection and agriculture.

Work on applications development and eventual commercialization in collaboration with Indian industries is being explored.


2.36nm
2.84nm
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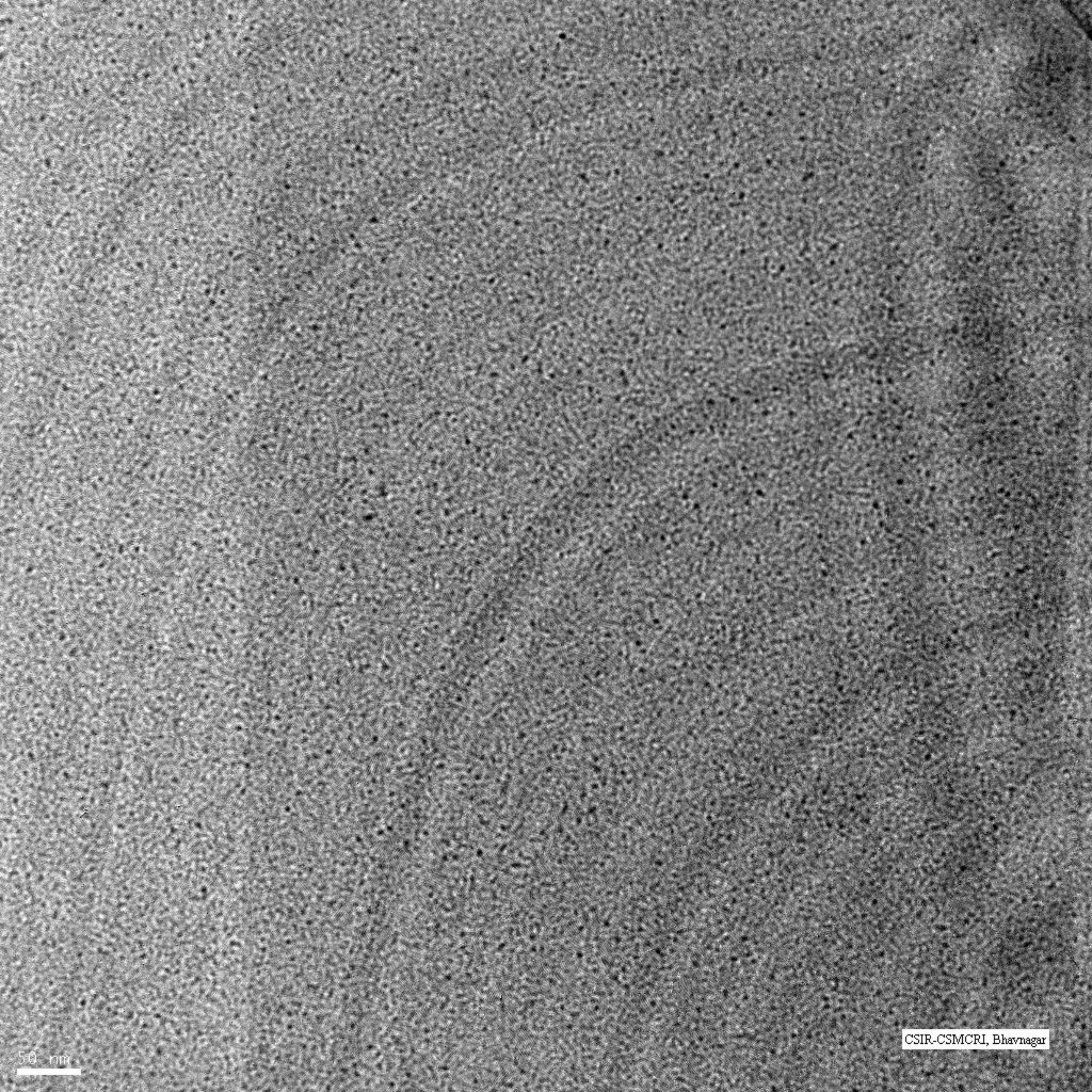
2.17nm
CSIR-CSMCRI, Bhavnagar
2 nm


50 nm
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