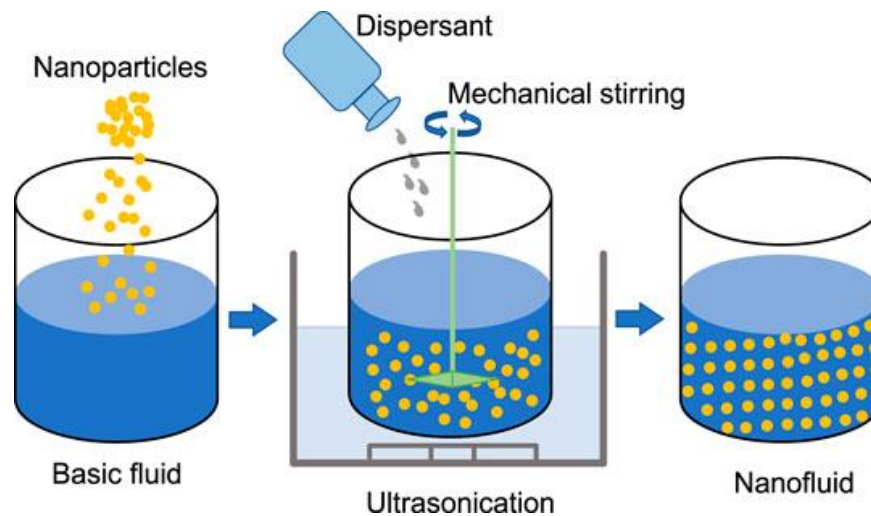


INTRODUCTION



Nanofluids - Explained

Author. Zion Pious Shilva.

Originative Mechanical & Mechatronics Engineer , Design Engineer.

April 23, 2023

Thermal properties of liquids play a decisive role in heating as well as cooling applications in industrial processes. **Thermal conductivity of a liquid is an important physical property that decides its heat transfer performance. Conventional heat transfer fluids have inherently poor thermal conductivity which makes them inadequate for ultra high cooling applications.**

Scientists have tried to enhance the inherently poor thermal conductivity of these conventional heat transfer fluids using solid additives following the classical effective medium theory (Maxwell, 1873) for effective properties of mixtures. Fine tuning of the dimensions of these solid suspensions to millimetre and micrometre ranges for getting better heat transfer performance have failed because of the drawbacks such as still low thermal conductivity, particle sedimentation, corrosion of components of machines, particle clogging, excessive pressure drop etc. Downscaling of particle sizes continued in the search for new types of fluid suspensions having enhanced thermal properties as well as heat transfer performance

It may be noted that particle size is an important physical parameter in nanofluids because it can be used to tailor the nanofluid thermal properties as well as the suspension stability of nanoparticles. Researchers in nanofluids have Department of Instrumentation, CUSAT 3 been trying to exploit the unique properties of nano particles to develop stable as well as highly conducting heat transfer fluids.