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Greenhouse gas sensors fabricated with new materials for monitoring climate change: A review

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With increasing utilization of fossil fuels in today's technological world, the atmosphere is having increased concentrations of greenhouse gases that need to be controlled in it. For achieving this goal, it is imperative to have sensors that could provide the data on greenhouse effect gases in the environment. The recent literature contains a few publications using new methods and materials for sensing these gases. The first part of this review is focused on the possible effects of greenhouse gases in the atmosphere and the second part surveys the developments of sensors for greenhouse gases with coverage on carbon nano materials and the composites directed towards sensing gases like CO₂, CH₄ and NO_x (Figure 1). With carbon dioxide measurements, due consideration for the dissolved carbon dioxide gas in water (moisture) is focused. The density functional calculations projects Pd doped single walled carbon nanotubes as ideal for the development of NO_x sensor. The current trend is to make sensors through 3D printing or inkjet printing to allow the reach of ppb levels of sensitivity that has not been realized before.

Biography

Kalathur Santhanam has been actively working on developing clean energy programs and has been actively developing sensors that would monitor greenhouse gases in the atmosphere. He has published over 150 papers in peer reviewed journals and also co-authored books on hydrogen technology and clean energy. He is teaching courses on clean energy at Rochester Institute of Technology, Rochester.

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