

Hot idea: Nano firefighters to stop spread of flames

IIT-Gn Faculty Members, Students File 16 Patents In 6 Years

Parth.Shastri@timesgroup.com

Ahmedabad: With modern constructions using wood extensively, and plaster of paris and composite materials being prone to fires, house owners and interior designers have been constantly seeking material that can prevent the spread of flames. A city like Ahmedabad records an average of eight fire calls of which four are from residential buildings.

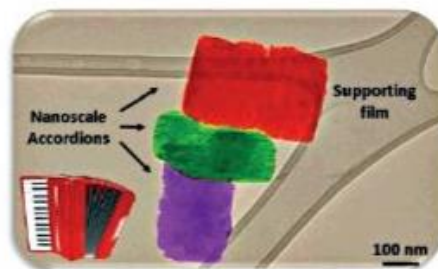
A team from IIT Gandhinagar (IIT-Gn) has turned

sheets — called nano accordion, due to its resemblance to the musical instrument — that are so tightly bonded that they prevent the spread of flames. The team has got two patents for the composition and process.

“The thickness of the material is one hundredth of a human hair at 300-400 nano meters,” said Jasuja. “A method was developed to exfoliate magnesium diboride to get the material which can later be used to prepare nanosheets. These nano accordions can be used to impart very high degree of flame retardancy to a polymer matrix that is otherwise flammable.”

Jasuja said that the material is found to be superior to a few materials in the same class. “It’s a new use for magnesium diboride,” he said. The material works on the principle of resisting van der Waals forces — interaction between atoms and molecules based

on distances. The material discourages such connection in case of fire, preventing further spread. Researchers said that the material can either be used as a coat such as paint on the surface or can be integrated



to nano materials to seek a solution to the problem. Dr Kabeer Jasuja, assistant professor (chemical engineering) and Saroj Kumar Das, synthesized boron with magnesium diboride to produce layered nano

INNOVATION CATALOGUE

IIT Gandhinagar (IIT-Gn) has got 16 patents in six years till 2018. A few are at different stages of registration

► Teams led by Prof Uttama Lahiri have got multiple patents for varied products. A walking stick has been developed by the team for Parkinson’s disease patients. The stick, sensing hand movement and stride, can provide visual and auditory cues to the person. Another patent has been received for eye-tracking system to detect visuomotor dysfunction in a person through an interactive computer programme. The team has also developed an easy to use multi-parameter patient monitoring system



► A few other patents include those for low-cost incense stick-making machine and single component trash bin which is difficult to reach for animals. And for strips that can be used to detect harmful pests on fruits and vegetables or water

► A team led by Dr Harish Palanhandalam-Madapusi, associate professor, invented a method to detect the onset of Parkinson’s Disease. A handheld device tracks response of eye muscles to external stimuli and a software compares reflexes over the period of time to assess health, helping doctors to detect disease much before physical manifestation of the disease such as tremors

► A team led by Dr Sivapriya Kirubakaran, assistant professor, has got patent for its work on synthesis of small molecules which can inhibit H pylori bacteria that is responsible for a number of stomach-related issues including cancer and ulcers. The team has also synthesized molecules to inhibit kinase, involved in cancer cell survival

► A team led by Dr Nithin V George, associate professor, has got two patents for improving hearing aid. The common issue faced by users is bad acoustics. The invention cancels excessive noise for better hearing

directly with the material at the time of production. Further research is ongoing, they said.

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