Improved fire detection with new ultra-sensitive, ultraviolet light sensor

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A new study published today in *Scientific Reports* has discovered that a material traditionally used in ceramics, glass and paint, can be manipulated to produce an ultra-sensitive UV light sensor, paving the way for improved fire and gas detection.

Researchers at the University of Surrey's Advanced Technology Institute manipulated zinc oxide, producing nanowires from this readily available material to create a ultra-violet light detector which is 10,000 times more sensitive to UV light than a traditional zinc oxide detector.

Currently, photoelectric smoke sensors detect larger smoke particles found in dense smoke, but are not as sensitive to small particles of smoke from rapidly burning fires.

Researchers believe that this new material could increase sensitivity and allow the sensor to detect distinct particles emitted at the early stages of fires, paving the way for specialist sensors that can be deployed in a number of applications.

"UV light detectors made from zinc oxide have been used widely for some time but we have taken the material a step further to massively increase its performance. Essentially, we transformed zinc oxide from a flat film to a structure with bristle-like nanowires, increasing surface area and therefore increasing sensitivity and reaction speed," said Professor Ravi Silva, co-author of the study and head of the Advanced Technology Institute.

The team predict that the applications for this material could be far reaching. From fire and gas detection to air pollution monitoring, they believe the sensor could also be incorporated into personal electronic devices, such as phones and tablets, to increase speed, with a response time 1000 times faster than traditional zinc oxide detectors.

"This is a great example of a bespoke, designer nanomaterial that is adaptable to personal needs, yet still affordable. Due to the way in which this material is manufactured, it is ideally suited for use in future flexible electronics, a hugely exciting area," added Professor Silva.

Provided by University of Surrey