

News Release

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Radical monitoring for healthy biofuels

New monitoring technology should be used to access the potential health risks of future biofuels before they are used in the community according to a new study by researchers from the ARC Centre of Excellence for Free Radical Chemistry and Biotechnology at the International Laboratory for Air Quality Health, the Queensland University of Technology.

Recently fuels substituted with over 20% ethanol have been suggested as an attractive alternative to reduce greenhouse emissions and reliance on fossil fuels. However this study led by Associate Professor Zoran Ristovski indicates these fuels may pose a health risk despite being more environmentally friendly.

“We have found that diesel substituted with ethanol levels greater than 20% contain high levels of free radicals and other reactive oxygen species which can be harmful to health”, reveals Associate Professor Ristovski.

Excessive exposure to free radicals in the air have been linked to a number of respiratory diseases, such as asthma.

“Traditionally only the mass of particles emitted by engines has been monitored and reductions in particle mass concentrations were seen to be improvements to the fuel. However what our research has shown is that other properties of particles should be monitored as these can be correlated with potential health risks”.

The team made the discovery using a novel chemical called a profluorescent nitroxide probe. The novel chemical fluoresces only when it encounters free radicals and the amount of fluorescence can be used to measure the levels of free radicals and other reactive oxygen species produced by ethanol fumigated engines.

The group plans to extend their studies to monitor free radical levels produced by other biofuels and are hoping that their technology will become part of the mandatory testing of biofuels before they are put to use in the community.

“Our long term goal is to ensure by extensive monitoring that new biofuels will not only reduce the carbon footprint but have lower associated health risks compared with current fuels on the market”, says Associate Professor Ristovski.

The work has recently been published in the international journal, Environmental Science and Technology.

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