QUANTIFICATION OF ETHANEDINITRILE IN AIR USING A NEW AND ACCURATE GAS CHROMATOGRAPHY METHOD

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Ethanedinitrile (EDN) is a new fumigant being trialled as a chemical disinfestation treatment to replace methyl bromide (MB) and is registered in Australia as a treatment for logs and sawn timber. Studies which have evaluated the toxicity of EDN to insect pests have used various analytical techniques, however, to our knowledge, there does not exist a standardised validated technique for accurately quantifying EDN in air.

We have developed a fast, accurate and reliable method to quantify the concentration of EDN in air. International recognised guidelines for the validation of non-standard analytical methods were used, including the International Council for Harmonisation of Technical Requirements for Pharmaceuticals for Human Use (ICH), European Commission - Technical Materials and preparations (EC) and the Australian Pesticides and Veterinary Medicines Authority (APVMA). The calculation of parameters from these guidelines include, but are not exclusive to, linearity, precision, accuracy, limit of detection (LOD) and limit of quantification (LOQ). Our tested method has a linearity, precision, accuracy, LOD and LOQ of: R^2 0.99, 1.36%, 98.8%, 0.750 ppm and 1.073 ppm, respectively.

Our method is suitable for all EDN fumigation studies that require detection at low and high concentrations simultaneously because it is accurate, fast and repeatable across a concentration range of 1 to 40,000 ppm.