

Title Simple ethylene monitoring for practical storage applications
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Abstract

The ethylene level in the atmosphere of a fresh produce store is a good indicator of storage conditions and the product's potential storage life.

The accurate measurement of ethylene at low levels is not an easy procedure and usually requires expensive equipment and scientifically trained operators.

As a result of a requirement from some produce storage industries to easily and economically measure and control ethylene levels we have gained considerable experience in successfully measuring ethylene in these situations with a simple measuring sensor.

An electrochemical sensor designed and made for safety monitoring of other gases in industrial chemical plants has been adapted and tuned with the appropriate electronics for the measurement of ethylene in both controlled atmosphere and regular cold storage rooms.

This sensor is not perfect and cannot be seen as a substitute for chromatograph measurements. There are cross responses to other gases, particularly Carbon Monoxide, but in many storage applications it is proving to be a very useful tool. A maximum measurement of 100 ppm can be made and continuous monitoring of atmospheres up to 15 ppm can be achieved. The sensitivity can, with care, be as low as 0.2 ppm.

There are about 500 of these sensors currently in use with the main applications detailed below. The addition and control of ethylene in the range of 1 to 50 ppm to ware potato storage rooms for the reduction of sprouting as an alternative CIPC - The addition and control of ethylene for Onions in both cold and controlled atmosphere storage rooms for the reduction of sprouting as an alternative to maleic hydrazide - The monitoring of the efficacy of the 1-MCP treatment of fruits by measuring the ethylene production rate of a produce sample contained in a sealed sample box. - The measurement of the ethylene concentration in a CA apple store to monitor the operation and progress of ethylene removal systems or the effectiveness of a 1-MCP treatment. - The checking of ambient produce cold storage rooms to monitor ethylene levels and determine the need for additional ventilation or the installation of ethylene removal systems. - The measurement and control of ethylene levels in the 1 to 25 ppm range for the de-greening of citrus fruit.