

INTISARI

KINERJA SPEKTROMETER FOTOAKUSTIK LASER CO₂ KONFIGURASI INTRAKAVITAS DAN APLIKASINYA PADA DETEKSI GAS ETILEN (C₂H₄) TOMAT BERLAPIS KITOSAN PADA SUHU DINGIN

Oleh

Ahmad Syaikhu

12/334829/PA/15028

Telah dilakukan optimasi daya laser pada spektrometer fotoakustik laser CO₂ konfigurasi intrakavitas. Daya maksimal yang dicapai sebesar (49.97 ± 0.06) W pada garis 10P20 dan daya pada 10P14 sebesar (17.01 ± 0.05) W dengan perbandingan komposisi gas medium aktif laser He:N₂:CO₂ yang digunakan adalah (30:50:50) mbar. Diperoleh Batas Deteksi Terendah (BDT) gas etilen sebesar (0.32 ± 0.03) ppbv pada garis laser 10P14 dengan faktor kualitas (Q) (11.6 ± 0.8) . Pengukuran gas etilen tomat dilakukan untuk menentukan pengaruh pelapisan kitosan dan suhu penyimpanan terhadap produksi gas etilen tomat. Produksi gas etilen tertinggi terjadi pada masa masak optimum, tomat berlapis kitosan 0%, 0.5%, dan 1% yang disimpan pada suhu dingin memproduksi gas etilen masing-masing sebesar 3.6 ppmv/gr, 2.4 ppmv/gr, dan 1.7 ppmv/gr. Pelapisan kitosan menghambat produksi gas etilen tomat, memperkecil presentasi penyusutan bobot tomat, dan meminimalisir penurunan tingkat kekerasan tomat selama masa penyimpanan, serta mampu menunda selama 1-3 hari terhadap terjadinya *chilling injury* pada penyimpanan suhu dingin (11°C).

Kata kunci: spektroskopi fotoakustik, laser CO₂, gas etilen tomat, pelapisan kitosan, penyimpanan pasca panen

ABSTRACT

***THE PERFORMANCE OF CO₂ LASER PHOTOACOUSTIC
SPECTROMETER INTRACAVITY CONFIGURATION AND ITS
APPLICATION TO DETECT ETHYLENE GAS (C₂H₄) OF CHITOSAN
COATED TOMATO AT COLD TEMPERATURE***

By

Ahmad Syaikhu

12/334829/PA/15028

The laser power optimization of CO₂ laser photoacoustic spectrometer intracavity configuration has been conducted. The highest power has obtained at line 10P20 (49.97 ± 0.06) W and (17.01 ± 0.05) W at line 10P14 with gas medium active composition He:N₂:CO₂ was (30:50:50) mbar. The lowest detection limit has obtained (0.32 ± 0.03) ppbv at line of laser 10P14 with quality factor (11.6 ± 0.8). Measurements of ethylene gas is performed to determine the effect of chitosan coating and storage temperature on the ethylene gas production. The highest ethylene gas production at the optimum ripe, ethylene gas production of tomato coated by chitosan 0%, 0.5%, 1% and stored at cold temperature were 3.6 ppmv/gr, 2.4 ppmv/gr, and 1.7 ppmv/gr, respectively. Coating chitosan inhibit the ethylene gas production of tomatoes, weight shrinkage presentation, hardness level of tomato during storage, and is able to delay the occurrence of chilling injury at cold temperature storage (11°C) for 1-3 days.

Keywords: photoacoustic spectroscopy, CO₂ laser, ethylene gas of tomato, chitosan coating, post-harvest storage