ABSTRAK

AYU GUSTIARA PASYAH. Analisis Distribusi Unsur Emisi Gas Buang Kendaraan Bermotor dengan Teknik *Laser Induced Breakdown Spectroscopy* (LIBS). Dibawah Bimbingan MANGASI A. MARPAUNG, RISER FAHDIRAN.

Telah dilakukan penelitian untuk mengidentifikasi distribusi unsur emisi gas buang kendaraan bermotor dengan teknik *Laser Induced Breakdown Spectroscopy* (LIBS). Sampel berupa tanah diambil pada tiga lokasi berbeda dengan variasi jarak dan kedalaman tanah dari lingkungan penduduk sekitar jalan raya. Sampel dipeletisasi dan ditembakkan laser Nd:YAG 1064 nm dengan energi 83 mJ dan 44 mJ dioperasikan dalam mode *Q-switching*. Data penelitian berupa spektrum antara panjang gelombang dan intensitas. Spektrum yang terbentuk dari keseluruhan sampel menunjukkan unsur karbon dan sulfur yang cukup tinggi. Intensitas unsur karbon dan sulfur pada permukaan lebih besar dibandingkan pada kedalaman 15 cm. Intensitas unsur karbon dan sulfur menurun seiring bertambahnya jarak pengambilan sampel dari jalan raya. Tidak ditemukan puncak gelombang yang signifikan untuk logam berat Pb dan diperkirakan sebagai *noise* dari sinyal *background*.

Kata kunci. emisi gas buang, LIBS, spektroskopi.

ABSTRACT

AYU GUSTIARA PASYAH. Analyzing Distribution of Elements as Exhaust Emissions of Motorized Vehicles using Laser Induced Breakdown Spectroscopy (LIBS) tehnique. Under supervision by MANGASI A. MARPAUNG, RISER FAHDIRAN.

Spectral analysis to identify the distribution of elements as exhaust emissions of motorized vehicles has been done using Laser Induced Breakdown Spectroscopy (LIBS). The soil samples were taken at three different locations with various of depths and distances from population around the highway. All samples were pelletized and ablated by Q-switched Nd:YAG laser 1064 nm operating at 83 mJ and 44 mJ. The quantitative result shown in spectrum between wavelength and intensity. The spectrum was formed by all the samples showed carbon (C) and sulphur (S) with high intensity. Intensity of carbon and sulfur on the surface is greater than at deeper soil at 15 cm of the soil surface. Intensity of carbon and sulphur decreases with increasing distance from the highway. Significant peaks were not found for heavy metal of Pb, it were estimated as noise from the background signal.

Keywords. exhaust emissions, LIBS, spectroscopy.