GAMBARAN KONSENTRASI KARBON MONOKSIDA (CO) PADA HARI KERJA DAN HARI LIBUR DI JALAN MAGELANG KAWASAN PERSIMPANGAN DENGGUNG SLEMAN 2026

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INTISARI

Latar belakang : Pertumbuhan volume kendaraan bermotor di Kabupaten Sleman yang tidak sebanding dengan kapasitas jalan memicu kemacetan parah di Persimpangan Denggung. Antrean di lampu lalu lintas menyebabkan mesin menyala diam (*idling*) dan memicu pembakaran tidak sempurna, sehingga melepaskan emisi Karbon Monoksida (CO) yang tinggi. Gas *silent killer* ini sangat berbahaya karena daya ikatnya terhadap hemoglobin melebihi Oksigen, berisiko bagi kesehatan masyarakat
Tujuan : Mengetahui gambaran konsentrasi CO, perbandingan pada hari kerja dan hari libur, serta hubungan volume kendaraan dengan konsentrasi CO.
Metode: Penelitian ini menggunakan observasi dan pengukuran. Sampel diambil di empat titik pada hari kerja (Senin, Selasa, Rabu) dan hari libur (Minggu) pada waktu pagi (07:00-08:00 WIB), siang (12:00-13:00 WIB), serta sore (15:00-16:00 WIB)
Hasil: Rata-rata konsentrasi CO hari kerja sebesar 14.332 µg/m³ dan hari libur 11.235 µg/m³. Keduanya melebihi Baku Mutu Udara Ambien Nasional (PP No. 22 Tahun 2021) sebesar 10.000 µg/m³. Uji Mann-Whitney menunjukkan perbedaan signifikan konsentrasi CO antara hari kerja dan libur (*p-value* = 0,000). Uji Spearman Rank menunjukkan hubungan positif yang kuat antara volume kendaraan dengan konsentrasi CO (r = 0,685; *p-value* = 0,000).
Kesimpulan: Konsentrasi CO di Persimpangan Denggung melampaui baku mutu yang lebih dipengaruhi oleh tingginya volume lalu lintas, dengan tingkat polusi tertinggi terjadi pada hari kerja.

Kata kunci: Karbon Monoksida; kendaraan bermotor; volume kendaraan

DESCRIPTIVE STUDY OF CARBON MONOXIDE (CO) CONCENTRATION DURING WEEKDAYS AND WEEKENDS AT MAGELANG STREET, DENGGUNG INTERSECTION AREA, SLEMAN IN 2026

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ABSTRACT

Background: The growth of motor vehicle volume in Sleman Regency, which is disproportionate to road capacity, triggers severe traffic congestion at the Denggung Intersection. Queuing at traffic lights causes engines to idle and triggers incomplete combustion, releasing high emissions of Carbon Monoxide (CO). This silent killer gas is highly dangerous because its binding affinity to hemoglobin exceeds that of Oxygen, posing a risk to public health.
Objective: To determine the profile of CO concentration, compare its levels between weekdays and weekends, and analyze the relationship between vehicle volume and CO concentration.
Methods: This study used observation and direct measurement methods. Samples were collected at four points on weekdays (Monday, Tuesday, Wednesday) and weekends (Sunday) during the morning (07:00-08:00 WIB), afternoon (12:00-13:00 WIB), and evening (15:00-16:00 WIB).
Results: The average CO concentration on weekdays was 14,332 µg/m³ and on weekends was 11,235 µg/m³. Both exceeded the National Ambient Air Quality Standard (Government Regulation No. 22 of 2021) of 10,000 µg/m³. The Mann-Whitney test showed a significant difference in CO concentration between weekdays and weekends (*p-value* = 0.000). The Spearman Rank test indicated a strong positive correlation between vehicle volume and CO concentration (r = 0.685; *p-value* = 0.000).
Conclusion: The CO concentration at the Denggung Intersection exceeded the quality standard, which was significantly influenced by high traffic volume, with the highest pollution levels occurring on weekdays

Keywords: Carbon Monoxide; motor vehicles; vehicles volume