Carbon Monoxide

Title	Carbon Monoxide Potentiates High Temperature-Induced Nicotine Biosynthesis in Tobacco
Author Name	Tielong Cheng, Liwei Hu, Pengkai Wang, Xiuyan Yang, Ye Peng, Ye Lu, Jinhui Chen & Jisen Shi
Journal Name	Int. J. Mol. Sci.
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Abstracts	Carbon monoxide (CO) acts as an important signal in many physiological responses in plants, but its role in plant secondary metabolism is still unknown. Nicotine is the main alkaloid generated in tobacco and the plant hormone jasmonic acid (JA) has previously been reported to efficiently induce its biosynthesis. Whether and how CO interacts with JA to regulate nicotine biosynthesis in tobacco remains elusive. In this study, we demonstrate that high temperature (HT) induces quick accumulation of nicotine in tobacco roots, combined with an increase in CO and JA concentration. Suppressing CO generation reduced both JA and nicotine biosynthesis, whereas exogenous application of CO increased JA and nicotine content. CO causes an increased expression of NtPMT1 (a key nicotine biosynthesis enzyme), via promoting NtMYC2a binding to the G-box region of its promoter, leading to heightened nicotine levels under HT conditions. These data suggest a novel function for CO in stimulating nicotine biosynthesis in tobacco under HT stress, through a JA signal.
Keywords	carbon monoxide; high temperature; nicotine; jasmonic acid; tobacco

Title	Particulate Matter and Carbon Monoxide Emission Factors from Incense Burning
Author Name	Abhinay Jilla and Bhaskar Kura
Journal Name	Environment Pollution and Climate Change
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Abstracts	Indoor air quality is a growing concern in the world. People spend a considerable amount of time in indoor environments such as homes, workplaces, shopping malls, stores and places of worships such as churches, temples and mosques. Most often incense burning takes place in places of worship which are enclosed spaces full of worshippers. Incense burning releases pollutants such as particulate matter (PM), carbon monoxide (CO) and volatile organic compounds. Exposure to these kinds of pollutants can result in adverse health effects. The purpose of this research is to determine the particulate matter and carbon monoxide emission factors (EFs) from incense stick burning. A test chamber with a rectangular exhaust duct, a fan to exhaust air with pollutants in it and pollutant sensors were used to achieve the project goals. Several experiments were performed with different cases/ scenarios to accurately estimate the EFs and several test runs were conducted for each case to test the repeatability of the results. EFs for CO (mass), PM2.5 (mass), PM2.5 (number), PM10 (mass), PM10 (number) were developed in this research which should help in (a) assessing exposures, (b) designing ventilation systems and (c) assessing potential health risks.
Keywords	Carbon monoxide emission; Pollutant; Pollution

Title	**An assessment on dispersion of carbon monoxide from a cement factory**
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Journal Name	Environmental Health Engineering and Management Journal
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Abstracts	Background: Modeling the dispersion of pollutants from factory stacks addresses the problem of matching emissions of a cement plant with the capacity of the environment to avoid affecting the environment and society. The main objective of this study was to simulate the dispersion of carbon monoxide (CO) from the main stack of a cement plant in Doroud, Iran using SCREEN3 software developed by the US Environmental Protection Agency (US EPA). Methods: Four samplings were conducted to measure the concentration of CO in the three-stack flow of a cement factory. The input parameters were those affecting gas dispersion and included CO rate, meteorological parameters, factors associated with the stack, and various factors related to the receptor. All factors were incorporated in the model, and dispersion was modeled by SCREEN3. Results: Southwesterly winds have been dominant in the past 5 years. According to the results of this study, the highest and the lowest CO levels were estimated by the model in spring and autumn as having maximum amounts of 842.06 and 88.31 µg/m3 , respectively, within distances of 526 and 960 m from the cement plant, respectively, at a downwind southwesterly direction from the plant. Conclusion: Although the maximum predicted CO levels in each of the four seasons were lower than the NAAQS criteria, the simulation results can be used as a base for reducing CO emissions to prevent the potentially significant health and environmental impacts imposed by long-term contact to such emissions.
Keywords	Modeling; Carbon monoxide; SCREEN3; Cement plant