The relationship between daily maximum temperature and daily maximum ground level ozone concentration

ABSTRACT

Ground-level ozone is one of the dominant criteria pollutants that contribute to unhealthy days in ambient air measurements throughout Malaysia. In addition to VOCs and NOx, meteorological factors such as insolation and temperature influence the formation of ground-level ozone. For this reason, the relationship between daily maximum temperature and variation of ground-level ozone concentrations using 10 years of data (2000-10, excluding 2008) was scrutinized statistically at two stations representing urban and industrial areas in Terengganu State, Malaysia. We found that there is a positive linear correlation between maximum daily temperature and maximum daily ozone concentration with correlation coefficients of 0.684 and 0.605 for urban and industrial areas, respectively. Nevertheless, the long-term variation of daily maximum temperature and daily maximum ozone concentration for these two stations shows that the levels were higher in the industrial rather than the urban area. The results indicate that surrounding activities and temperature play vital roles in influencing ground-level ozone concentrations in Terengganu. Furthermore, ozone concentrations are highest for air masses characterized by dry, warm conditions during the southwest monsoon and are usually associated with the generation of haze episodes in the Malaysian Peninsula.

Keyword: Ground-level ozone; Daily maximum temperature; Surrounding activities; Terengganu