

ABSTRACT

Ambient air quality has been deteriorating in large cities for the past two centuries now. Industries like brick kilns and steel mills are contributing majorly in discharge of pollutants and disturbing the balance of gases in atmosphere. Monitoring of air pollutants is an important measure to devise policies and mitigation measures on reducing air pollution. Therefore, current research has been conducted to highlight the role of brick kiln and steel mill industries in deterioration of ambient air quality of Lahore. The gases NO₂, SO₂, CO and O₃ were assessed at two sites i.e. Mehmood Booti and Kala Khatia Narang Mandi Road as representatives of steel mill and brick kiln clusters respectively in three months January, March and June. Aerocal portable air quality equipment was used to measure gases using different sensor heads. The concentration of pollutants were compared at both study areas, compared with standards and then related with metrological conditions. The results estimated that the mean concentrations of NO₂, O₃ and SO₂ were 147.89, 41.5 and 192.9 $\mu\text{g}/\text{m}^3$ respectively in brick kiln area, higher as compared to steel industrial area i.e. 129.6, 32 and 159.08 $\mu\text{g}/\text{m}^3$ respectively. However, CO was found to be 4.14 mg/m³ in steel mill area than 3.31 mg/m³ in brick kiln area. When mean values were compared with PEQS, NO₂ (147.89 $\mu\text{g}/\text{m}^3$) and SO₂ (129.6 $\mu\text{g}/\text{m}^3$) were exceeding the permissible limits i.e. 80 and 120 $\mu\text{g}/\text{m}^3$ respectively, while other two gases O₃ and CO were within the standards. The ambient air pollutants were found to be released in high concentrations in winter i.e. 4.48 mg/m³ CO, 213 $\mu\text{g}/\text{m}^3$ NO₂ and 236 $\mu\text{g}/\text{m}^3$ SO₂ in brick kiln area, and 5.57 mg/m³ CO, 151.55 $\mu\text{g}/\text{m}^3$ NO₂ and 189 $\mu\text{g}/\text{m}^3$ SO₂ in steel mill area than in summer i.e. 2.5 mg/m³ CO, 89.81 $\mu\text{g}/\text{m}^3$ NO₂ and 140.89 $\mu\text{g}/\text{m}^3$ SO₂ in brick kiln area and 2.9 mg/m³ CO, 72.89 $\mu\text{g}/\text{m}^3$ NO₂, 139.6 $\mu\text{g}/\text{m}^3$ SO₂ in steel mill area, unlike O₃. Correlation analysis illustrated that CO, NO₂ and SO₂ showed negative correlation coefficients with temperature and wind speed, and positive correlation coefficients with humidity and pressure.