Short Communication

Preparation of electrochemical sensor assisted unmanned aerial vehicles system for SO₂, O₃, NO₂, CO and PM_{2.5}/PM₁₀ detection in air

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The spatial and especially vertical monitoring of atmospheric pollutants is of great significance to the analysis and prevention of air pollution. It is also a useful supplement to the current monitoring method which is mainly based on ground monitoring stations. Small UAVs offer a new way of vertical monitoring of air pollution. In this study, an electrochemical sensor incorporated unmanned aerial vehicles (UAV) platform was proposed, which can detect pollution at vertical heights, and has been used for PM_{2.5}, PM₁₀ and 4 pollutants (SO₂, O₃, NO₂, CO) at different heights. Based on this monitoring data, the vertical distribution characteristics as well as the statistical correlation of PM_{2.5} and its pollutants were analyzed. The experimental results show that PM_{2.5} concentration increases with height in the larger integrated industrial areas, while it decreases and then increases near the small-scale industrial and residential areas. The trends of PM₁₀ and PM_{2.5} are basically consistent. In the vertical direction, the maximum values of CO and SO₂ always appear near the ground and then start to decrease, and NO₂ increases with the height.

Keywords: UVA system; Electrochemical gas sensor; Pollutants; Atmospheric pollution; Spatial distribution

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