CURRENT SITUATION OF AIR POLLUTION IN JAPAN AND DESIRABLE FUTURE AIR MONITORING SYSTEM

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ABSTRACT

Since the industries have been extensively developed in Japan after the second world war, we had to confront with severe air pollution problems.

Although in 1950's the major air pollution problems have been smoke and SO_2, after 1960's the advent of petroleum as the major fuel and raw material of chemical industries, automobiles, power industry and so on we had extended problems of pollution by SO_2, NO_x and CO. Particulate is an old but a new problem. Since the last half of 1960's high oxidant level above 0.2 ppm has been frequently observed in Tokyo and in many other cities all over Japan. Further in Tokyo, Osaka and other areas people, particularly students were suffered from symptoms of eye and throat irritations, and sometimes numbness and other severe symptoms. Plants were also suffered from injuries by ozone and PAN. Recently so-called acid rain caused the eye irritation to many urban and non-urban dwellers.

In order to control the air pollution Japanese government set up the Environment Agency in 1971, and the ambient air quality standards were established by the government as shown in Table 1.

Table 1. Ambient air quality standards in Japan

Pollutant	Averaging time (hour)	Concentration (ppm) not to be exceeded
SO_2	1	0.1
	24	0.04
NO_2	24	0.02
CO	8	20
	24	10
Oxidant	1	0.06
Particulates	1	200 (g/m^3)
	24	100 (")

The ambient air quality standard of hydrocarbon is going to be enacted in the near future.

Other important pollutants are HF and other fluorides, HCl, odorous gases (methylmercaptan, H_2S, dimethyl sulfide, NH_3, trimethyl amine etc.), aldehydes, PAN and other photochemically produced compounds, and particulates components such as sulfates, nitrates, metals and polycyclic hydrocarbons.

In order to achieve air monitoring the continuous recorders as listed in Table 2 have been employed.

Table 2. Air monitoring instruments currently employed in Japan

Pollutant	Instrument
SO_2	Electroconductivity recorder
NO_2	Saltzman's colorimetric recorder
CO	Nondispersive infrared recorder
Oxidant	KI colorimetric recorder
Particulates	Light scattering aerosol recorder (Calibrated by weight concentration measured by low volume air sampling on a filter)

However each one of the above instruments has disadvantages in the interference of other pollutants, sensitivity, labor of their operation and so on.

Then the following remote sensing is particularly important in the future air monitoring system.

(1) The remote sensing of emission sources involving complicated and areal sources.

(2) Three dimensional wide area remote sensing of meteorological elements and ambient concentration of pollutants.