**Supplemental Information**

Morphological characterization and chemical composition of PM2.5 and PM10 collected from four typical Chinese restaurants.

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Additional information as noted in text. Tables describing restaurant information and cooking fumes during sampling. Information regarding calibration of the DustTraks (Model 8530, TSI, USA).



Figure S1. Concentrations of PM2.5 and PM10 from the four restaurants from 11:00 am to 13:00 pm. The data was recorded every five minutes. Figure 1(a) was Cantonese style (GD), (b) Sichuan style (SC), (c) Xibei (XB) style and (d) Hunan (HN) style.



Figure S2. Micrographs and chemical analysis of rectangular particles using EDS.



Figure S3 Micrographs and chemical analysis of irregular particles with EDS.

Table S1. The basic information of each restaurant

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Restaurant | Method | Ingredients | Spices | Number of stoves | Attendance | Maximum Number of diners |
| Cantonese (GD) | Steam, boil and simmer. | Main: Meat type - seafood, goose, pigeonVegetable- cabbage, broccoliOthers: rice, milk, coconut | Salt, sugar | 4 | 90% | 66 |
| Sichuan (SC) | Stir-frying, pan-frying and deep frying | Main: Meat type - pork, chicken, beefVegetable- lettuce, potato, gingerOthers: rice, animal innards | Sichuan Pepper, Chili pepper, shallots, garlic, ginger, salt | 4 | 95% | 60 |
| Hunan (HN) | Quick-frying, boil and steam | Main: Meat type - fresh-water fish, pork, duckVegetable- carrots, cucumberOthers: rice, eggs | Chili pepper, salt, essence of chicken | 5 | 85% | 72 |
| Xibei (XB) | Grill, roast and boil | Main: Meat type - Lamb, beef, chickenVegetable- carrots, cucumberOthers: flour, noodles, yoghurt | Black pepper, cumin, Chili pepper | 5 | 80% | 70 |

Table S2. The basic information of cooking fumes during sampling.

|  |  |  |  |
| --- | --- | --- | --- |
| Restaurant | Temperature | Relative humidity | SO2 (mg / m3) |
| Cantonese (GD) | 26.5℃ | 67% | 0.0113 |
| Sichuan (SC) | 28℃ | 65% | 0.0124 |
| Hunan (HN) | 27℃ | 69% | 0.0112 |
| Xibei (XB) | 27.5℃ | 73% | 0.0116 |

Calibration of the DustTraks

Before sampling, the Dsttrak samplers were combined with a low-volume sampler (MiniVol TAS, Airmetrics) to determine the calibration factor for the PM emitted from these restaurants. The two instruments were started at the same time, and the sampling time was 30 minutes at a flow rate of 3L/min. Then, the mass concentration in mg/m3 was determined using the Dusttrak sampler and the MiniVol samples (quartz fiber filters, 47 mm diameter, Whatman) were weighed. Then, the new calibration constant, NewCal, was computed using the following formula:

$$NewCal=\left(\frac{MiniVol Concentration}{DustTrak Concentration}\right)×CurrentCal$$

Finally, select photometric and enter the NewCal.