Porous Silica Spheres as Indoor Air Pollutant Scavengers

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Supporting Information

Particle size distributions (PaSD) were measured using a Malven particle sizer, shown in Figure S1.

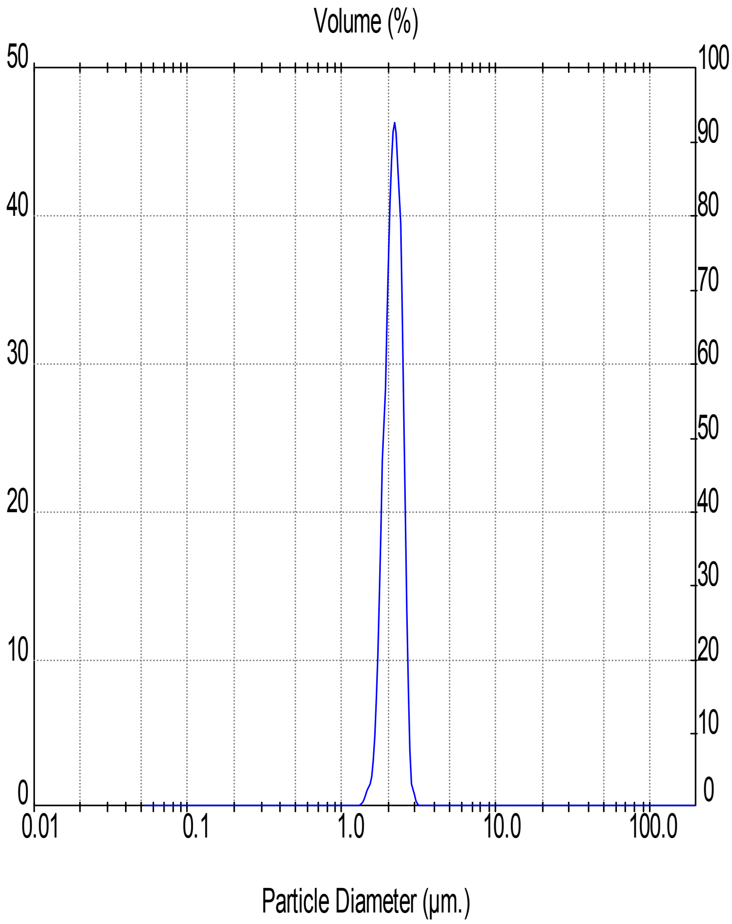

Figure S1 Particle size distribution of SSPH.

The D90/10 value, which is used as a measure of the mono-dispersivity of the SSPH, Table S1. D10 is defined as the particle diameter at 10% of the cumulative particle size distribution; D90 is defined as the particle diameter at 90% of the cumulative particle size distribution. D90/10 is defined as the ratio of the D90 value to the D10 value, this was calculated to be 1.35, indicating a high level of monodispersivity.

Table S1 Particle size distribution for SSPH from which D90/10 is calculated.

Conc. = 0.0013 %Vol	Density = 2.220 g/cm^3	S.S.A.= 1.2662 m^2/g
Distribution: Volume	D[4, 3] = 2.17 um	D[3, 2] = 2.13 um
D(v, 0.1) = 1.84 um	D(v, 0.5) = 2.17 um	D(v, 0.9) = 2.50 um
Span = 3.039E-01	Uniformity = 1.001E-01	

Size (um)	Volume In %	Size (um)	Volume In %	Size (um)	Volume In %	Size (um)	Volume In %
0.05	0.00	0.58	0.00	6.63	0.00	76.32	0.00
0.06	0.00	0.67	0.00	7.72	0.00	88.91	0.00
0.07	0.00	0.78	0.00	9.00	0.00	103.58	0.00
0.08	0.00	0.91	0.01	10.48	0.00	120.67	0.00
0.09	0.00	1.06	0.03	12.21	0.00	140.58	0.00
0.11	0.00	1.24	0.24	14.22	0.00	163.77	0.00
0.13	0.00	1.44	2.11	16.57	0.00	190.80	0.00
0.15	0.00	1.68	18.54	19.31	0.00	222.28	0.00
0.17	0.00	1.95	43.70	22.49	0.00	258.95	0.00
0.20	0.00	2.28	33.80	26.20	0.00	301.68	0.00
0.23	0.00	2.65	1.58	30.53	0.00	351.46	0.00
0.27	0.00	3.09	0.00	35.56	0.00	409.45	0.00
0.31	0.00	3.60	0.00	41.43	0.00	477.01	0.00
0.36	0.00	4.19	0.00	48.27	0.00	555.71	0.00
0.42	0.00	4.88	0.00	56.23	0.00	647.41	0.00
0.49	0.00	5.69	0.00	65.51	0.00	754.23	0.00
0.58		6.63		76.32		878.67	

In a previous article the precision of the analytical method was calculated by taking 5 replicate samples from the chamber (i.e. sampling port before the entrance of the denuder tube) using both the gas-tight syringe and PFBHA impingers[1]. The reproducibility, in terms of the relative standard deviation, is shown in Table S3. The relative standard deviation ranged from 3 to 14.3 % depending on the compound. This method provides a satisfactory level of precision as the values take into account the variability in sampling, derivatisation, extraction, filtration and GC-MS analysis with the PFBHA impinger.

Table S2 Relative standard deviations (%) obtained (n=5) for GC-MS injections during trapping efficiency tests[1].

Compund	PFBHA Impinger
Acetone *	9.9 %
Butraldehyde	7 %
Pentanal	3 %
Hexanal *	3 %
Benzaldehyde	11.5 %
p-tolualdehyde	12.8 %
Glyoxal	14.3 %
Methylglyoxal	12.6 %

* The relative standard deviation for acetone and hexanal are estimated based on experiments carried out for acrolein and pentanal.

Table S3 Relative standard deviations (%) obtained (n=3) for GC-FID injections during trapping efficiency tests[1].

Compound	Standard deviation
Benzene	1.10 %
Toluene	2.29 %
p-Xylene	6.04 %
1,3,5-trimethylbenzene	27.71 %

The error was observed to increase with increased retention time as broader peaks lead to less reproducible values.

References

1. Temime, B.; Healy, R. M.; Wenger, J. C., *Environ. Sci. Technol.* **2007,** 41, 6514-6520.