Supplementary materials for Impact of air pollution control measures and regional transport on carbonaceous aerosols in fine particulate matter in urban Beijing, China: Insights gained from long-term measurement

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Table S1. Ratio of TC to PM_{2.5} in this study and in previous studies.

Cities	Method	Period	TC/PM _{2.5} (%)	References
Budapest, Hungary	EA	June 2010- May 2011	40.0%	Szigeti et al., 2013
Istanbul, Turkey	EA	June 2010- May 2011	30.0%	Szigeti et al., 2013
Beijing, China	TOR	March 2005-February 2006	27.6%	Yang et al., 2011c
Chongqing, China	TOR	March 2005-February 2007	28.3%	Yang et al., 2011c
Shanghai, China	TOR	March 2005-February 2008	34.5%	Yang et al., 2011c
Guangzhou, China	TOR	March 2005-February 2009	26.4%	Yang et al., 2011c
Melbourne, Australia	-	the autumn–early winter period	60–80%	Keywood et al., 2011
		the summer months	20–40%	Keywood et al., 2011
		December 2006-January 2007	30–50%	Keywood et al., 2011
Petroleumkaai, Belgium	TA	18/09/2001-29/10/2001&19/12/2002-23/02/2003	32.0%	Bencs et al., 2010
		01/02/2002-26/03/2002&27/09/2002-		
Hasselt, Belgium	TA	04/11/2002	23.0%	Bencs et al., 2010
		16/05/2002-26/06/2002&05/11/2002-		
Mechelen, Belgium	TA	03/01/2003	24.0%	Bencs et al., 2010
Ghent, Belgium	TOT	Jun.10-Jul. 7 2004	31.7%	Viana et al., 2007
Ghent, Belgium	TOT	Jan. 10-Feb.14 02005	22.3%	Viana et al., 2007
Barcelona, Spain	TOT	Jul. 27–Aug.31 2004	32.6%	Viana et al., 2007
Barcelona, Spain	TOT	Nov. 11–Dec. 16 2004	28.8%	Viana et al., 2007
Amsterdam, Holland	TOT	Jul. 4-Aug. 2 2005	24.4%	Viana et al., 2007

Amsterdam, Holland	TOT	Jan. 9-Feb. 16 2006	32.6%	Viana et al., 2007
Diamond Bar, USA	-	Oct. 31-Nov. 2, 1997	29.5%	Allen et al., 2000
Mira Loma, USA	-	Oct. 31-Nov. 2, 1997	36.6%	Allen et al., 2000
Los Angeles (Riverside), USA	-	Oct. 31-Nov. 2, 1997	30.5%	Allen et al., 2000
Mira Loma, USA	TOT	Sep. 2001-Feb, 2002	30.5%	Na et al., 2004
Rubidoux, USA	TOR	Jan.-Feb. 1999	33.7%	Tolocka et al., 2001
Phoenix, USA	TOR	Jan.-Feb. 1999	73.2%	Tolocka et al., 2001
Philadelphia, USA	TOR	Jan.-Feb. 1999	33.3%	Tolocka et al., 2001
Los Angeles, USA	TMO	Jan. 1995-Feb. 1996	36.9%	Kim et al., 2000
San Nicolas Island, USA	TMO	Jan. 1995-Feb. 1996	24.6%	Kim et al., 2000
Beijing, China	TOR	Jul. 1999-Sep. 2000	30.2%	He et al., 2001
Abbotsford, Canada	TOR	May 1994-Feb. 1995	48.0%	Brook and Dann, 1999
Kaohsiung, Taiwan, CN	EA	Nov. 1998-Apr. 1999	21.3%	Lin and Tai, 2001
Sao Paulo, Brazil	TA	Jul.11-Sep.10, 1997	77.5%	Castanho and Artaxo, 2001
Hongkong (roadside site), China	TOT/TOR	2013	30.3%	a*
Hongkong (urban site), China	TOT/TOR	2013	44.5%	a*
Hongkong (suburban site), China	TOT/TOR	2013	27.0%	a*
Hongkong (new town site), China	TOT/TOR	2013	20.4%	a*
Hongkong (urban site), China	TOT/TOR	2013	26.7%	a*

Hongkong (new town site), China	TOT/TOR	2013	30.0%	a*
South Phoenix (traffic site), USA	TOT	Dec. 20, 2008 to Feb. 18, 2009	45.0%	Upadhyay et al., 2011
South Phoenix (airport site), USA	TOT	Dec. 20, 2008 to Feb. 18, 2009	49.2%	Upadhyay et al., 2011
South Phoenix (mixed site),USA	TOT	Dec. 20, 2008 to Feb. 18, 2009	48.9%	Upadhyay et al., 2011
Tongyu, China	TOR	Spring 2006	6.2%	Zhang et al., 2012
Zloty, Potok, Poland	TOT	2013	40.4%	Błaszczak et al., 2016
Raciborz, poland	TOT	2011 and 2012	44.5%	Błaszczak et al., 2016
Shangdianzi, China	TOR	Four seasons (2009-210)	20.4%	Zhao et al., 2013
Beijing, China	TOR	Four seasons (2009-211)	19.8%	Zhao et al., 2013
Tianjin, China	TOR	Four seasons (2009-212)	18.1%	Zhao et al., 2013
Shijiazhuang, China	TOR	Four seasons (2009-213)	19.0%	Zhao et al., 2013
Chengde, China	TOR	Four seasons (2009-214)	28.6%	Zhao et al., 2013
Fresno, China	TOR	Jan.1-Dec.26, 2000	43.5%	Watson and Chow, 2002
Xi'an (rural site), China	TOR	2010	16.4%	Wang et al., 2015
Xi'an (urban), China	TOR	2010	17.3%	Wang et al., 2015
Xi'an (downtown site), China	TOR	2010	15.4%	Wang et al., 2015
Xi'an (roadside site), China	TOR	2010	17.4%	Wang et al., 2015
Xi'an (urban site), China	TOR	2010	19.7%	Wang et al., 2015
Xi'an (reference site), China	TOR	2010	14.8%	Wang et al., 2015

Beijing (Tinghua site), China	TOT	2008	32.0%	Yang et al., 2011b
Beijing (Miyun site), China	TOT	2008	33.0%	Yang et al., 2011b
Beijing (Tinghua site), China	TOR	Jul 1999-Jun 2000	40.0%	He et al., 2001
Egbert, Canada	TOT	Jan. 2006-Nov 2007	38.0%	Yang et al., 2011a
Europe (average)	TOT	2008-2011	25.0%	Cavalli et al., 2016
Europe (average)	-	1996-2007	19.0%	Putaud et al., 2010
USA (average)	TOR	2005-2008	25.0%	Hand et al., 2011
China (average)	TOT/TOR/TMO	-	22.0%	Wang et al., 2016
				Ram and Sarin, 2010, 2012;
India (average)	-	-	20.0%	Bisht et al., 2015

a* http://www.epd.gov.hk/epd/sites/default/files/epd/english/environmentinhk/air/studyrrpts/files/final_report_mvtmpms_2013.pdf

TOR: thermal optical reflectance; TMO: thermal manganese oxidation; EA: elemental analysis; TA: thermal analysis

Fig. S1. Monthly variation of OC and EC concentrations from March 2013 to February 2018.

Fig. S2. Diurnal variation of OC concentrations from March 2013 to February 2018.

Fig. S3. Diurnal variation of EC concentrations from March 2013 to February 2018.

Fig. S4. Diurnal variation of OC concentrations in different seasons during the whole study period (in $\mu\text{g}/\text{m}^3$).

Fig. S5. Diurnal variation of EC concentrations in different seasons during the whole study period (in $\mu\text{g}/\text{m}^3$).

Fig. S6. Diurnal variations of OC concentrations on weekdays and weekend days during the whole study period (in $\mu\text{g}/\text{m}^3$).

Fig. S7. Diurnal variations of EC concentrations on weekdays and weekend days during the whole study period (in $\mu\text{g}/\text{m}^3$).

Fig. S8. Gridded emissions of OC and BC (proxy for EC) in Beijing (a) and China (b) from the MEIC (Multi-resolution Emission Inventory for China, <http://www.meicmodel.org>, unit: $\mu\text{g}/\text{m}^3/\text{s}$).

Fig. S9. Map with identification of the Chinese provinces, which are potential source areas of OC and EC in this study.

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