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A critical review of the use of iron isotopes in atmospheric aerosol research

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Table S1. Summary of $\delta^{56}Fe$ values for aerosols from relevant sources.

Sample	$\delta^{56}Fe$ for total Fe (‰)	$\delta^{56}Fe$ for dissolved Fe (‰)	Ref.
desert dust aerosols			
loess	+0.05±0.04 [a]	not reported	Beard et al., 2003
soil	+0.04±0.07 [a]	not reported	Beard et al., 2003
urban dust	-0.15 to +0.12	not reported	Beard et al., 2003
desert dust	+0.04±0.10 [b]	not reported	Fantle and DePaolo, 2004
desert soil	+0.08±0.04 [a]	not reported	Waeles et al., 2007
soil	-0.10 to 0.14	not reported	Majestic et al., 2009a
desert dust	+0.09±0.04 [a]	not reported	Mead et al., 2013
soil	+0.04±0.20 [a]	not reported	Kurisu and Takahashi, 2019
desert dust	-0.09±0.07	not reported	Chen et al., 2020
desert dust	+0.09±0.15 [a]	not reported	Li et al., 2022
anthropogenic aerosols			
coal fly ash	+0.33±0.37 [a]	not reported	Li et al., 2022
coal fly ash	+0.35±0.23 [a]	not reported	Mead et al., 2013
municipal waste fly ash	+0.10±0.08 [b]	not reported	Li et al., 2022
oil fly ash	+0.30±0.17 [a]	not reported	Mead et al., 2013
diesel particulate matter	-0.03±0.13 [b]	not reported	Mead et al., 2013

fly ash (incinerator)	-0.10±0.03 [b]	-1.97±0.18	Kurisu et al., 2016a
TSP (incinerator)	-0.66±0.09 [b]	not reported	Kurisu et al., 2016a
bottom ash (incinerator)	-0.08±0.09 [b]	-0.34±0.14	Kurisu et al., 2016a
Industrial ash	-0.12±0.04	-0.78 to -0.30	Maters et al., 2022
reed residual ash	+0.09±0.03 [a]	not reported	Kurisu and Takahashi, 2019
bulk aerosol (tunnel)	-3.16 to 0.3	not reported	Kurisu et al., 2016a
$PM_{>2.5}$ (parking structure)	+0.15±0.03 [a]	not reported	Majestic et al., 2019b
$PM_{2.5}$ (parking structure)	+0.18±0.03 [a]	not reported	Majestic et al., 2019b
metallurgy fly ash	+0.08 to 0.80	not reported	Flament et al., 2008
raw materials			
gasoline	+0.28±0.13 [b]	not reported	Kurisu et al., 2016a
waste oil	+0.04 to 0.11	not reported	Majestic et al., 2019b
metallic brake pad	+0.19	not reported	Majestic et al., 2019b
ceramic brake pad	+0.42 to +0.61	not reported	Majestic et al., 2019b
tire tread	-0.08 to +0.12	not reported	Majestic et al., 2019b
enriched ores	-0.16 to +1.19	not reported	Flament et al., 2008
wheat leaf	-0.05 to -0.02	not reported	Guelke and von Blanckenburg,
wheat stem	+0.09 to +0.17	not reported	2007
soybean leaf	-0.48 to -0.30	not reported	

soybean stem	-0.70 to -0.24	not reported	
oat leaf	-0.01 to +0.09	not reported	
oat stem	+0.06 to +0.07	not reported	
reed	+0.08±0.10 [a]	not reported	Kurisu and Takahashi, 2019

Table S2. Summary of δ^{56}Fe for ambient aerosols.

Sampling site	Aerosol	δ^{56}Fe for total Fe (‰)	δ^{56}Fe for dissolved Fe (‰)	Ref.
Jeju, Korea	TSP	range: +0.00 to 0.21; mean: +0.11±0.07	not reported	Beard et al., 2003
Dunhuang, China	TSP	range: -0.06 to -0.01; mean: -0.04±0.04	not reported	
Atlantic	not specified	mean: +0.04±0.09	average: +0.13±0.18‰	Waeles et al., 2007
Dunkirk, France	TSP	mean: +0.14±0.11	not reported	Flament et al., 2008
Phoenix, USA	PM_{10}	range: -0.23 to +0.04; mean: -0.07±0.11	not reported	Majestic et al., 2009a
	$PM_{2.5}$	range: -0.55 to -0.22; mean:-0.42±0.14		
Bermuda	$PM_{>2.5}$ (dust)	range: -0.05 to +0.16; mean: +0.10±0.05	not reported	Mead et al., 2013
	$PM_{2.5}$ (dust)	range: +0.00 to +0.16; mean: +0.08±0.05		
	$PM_{>2.5}$ (non-dust)	range: -0.04 to +0.24; mean: +0.10±0.06		
	$PM_{2.5}$ (non-dust)	range: -0.46 to +0.14; mean: -0.10±0.14		
Western equatorial Pacific	not specified	range: +0.27 to +0.38; mean: +0.33±0.06	not reported	Labatut et al., 2014
Hiroshima, Japan	size-segregated (March)	range: -1.59 to +0.23	range: -2.58 to 0.47	Kurisu et al., 2016b
	size-segregated (August)	range: -2.01 to +0.30	range: -3.91 to -0.24	
NW Pacific	$PM_{>2.5}$	range: -0.32 to -0.11; mean: -0.22±0.11	not reported	

	$PM_{2.5}$	range: -1.72 to -1.17; mean: -1.45±0.28		Kurisu et al., 2016b
Chiba, Japan	TSP	range: -3.53 to +0.33; mean: -0.52±1.02	range: -4.08 to +0.25	Kurisu et al., 2019
Tochigi, Japan	bulk aerosol (BB)	range: -0.61 to +0.13	not reported	Kurisu and Takahashi, 2019
	bulk aerosol (non-BB)	range: -1.26 to +0.17	not reported	
	0.39-0.69 μm (BB)	range: -0.61 to -0.36	range: -0.73 to -0.50	
	0.39-0.69 μm (non-BB)	range: -1.26 to -1.06	range: -1.93 to -1.33	
North Atlantic	TSP (Sahara dust)	range: +0.08 to +0.17; mean: +0.12±0.03	range: +0.05 to +0.12; mean: +0.09±0.02	Conway et al., 2019
	TSP (anthropogenic)	range: -0.16 to -0.04; mean: -0.12±0.06	range: -1.58 to -1.07; mean: -0.91	
NW Pacific	$PM_{>2.5}$	range: -0.24 to +0.43; mean: +0.15±0.18	-0.27±0.02	Kurisu et al., 2021
	$PM_{2.5}$	range: -2.16 to +0.43; mean: -0.33±0.83	range: -2.23 to -1.14; mean: -1.69±0.55	
Subarctic North Pacific	TSP	range: -0.47 to +0.45	range: -1.87 to +0.28	Kurisu et al., 2024
	size-segregated	range: -2.82 to +0.48	not reported	
East China Sea	0.57-1.0 μm	range: -3.35 to -0.45	range: -4.46 to -1.33	Hsieh and Ho, 2024
	1.0-1.6 μm	range: -1.16 to -0.06	range: -1.66 to +0.01	
	1.6-3.1 μm	range: -0.08 to +0.10	range: -0.16 to +0.26	
	3.1-7.3 μm	range: +0.00 to +0.16	range: -0.11 to +0.36	

	>7.3 µm	range: -0.06 to +0.14	range: -0.11 to +0.40	
North Pacific	TSP	range: -0.03 to +0.41	range: -1.28 to +0.02	Bunnell et al., 2025
	<0.49-0.95 µm (fine)	range: -0.39 to +0.36	not reported	
	>0.95 µm (coarse)	range: +0.02 to +0.27	not reported	
Equatorial and Tropical Pacific	>1 µm	range: -0.16 to +0.47	not reported	Camin et al., 2024

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